NATURAL HISTORY

OF THE

MAMMALIA.

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VOL. I.

CONTAINING THE ORDER

MARSUPIATA, OR POUCHED ANIMALS,

WITH

22 ILLUSTRATIONS ENGRAVED ON STEEL, AND 18 ENGRAVINGS ON WOOD.

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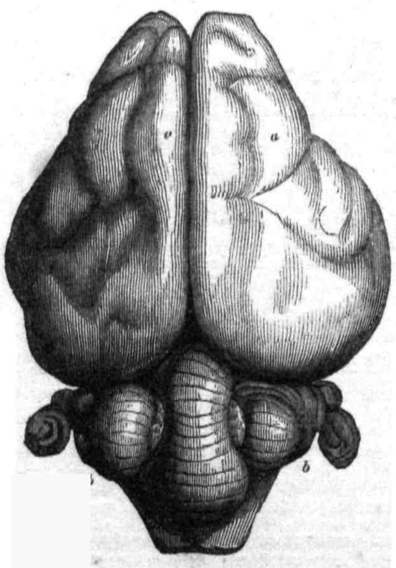
ORDER—MARSUPIATA.

The Marsupiata, or Marsupialia[1], are implacental mammalia, whose young are brought forth prematurely, and received, in most instances, into a peculiar pouch situated on the lower part of the abdomen of the female: both sexes are furnished with two bones, called marsupial bones, and which are attached to the anterior margin of the pelvis. The brain is deficient of both



Brain of a Kangaroo—(Owen).

a. a. The Cerebrum.
b. b. The Cerebellum.

[1] From *marsupium*, a purse or bag—having allusion to the peculiar pouch with which the female marsupial animals are furnished.

corpus callosum and septum lucidum: the cerebrum is small in proportion to the animal, contracted in front, and its surface is smooth, or presents but few convolutions: the cerebellum is entirely exposed[1], and has the vermiform process large in proportion to the lateral lobes; the olfactory lobes are large. Two venæ cavæ enter the heart[2].

The order Marsupiata embràces a large assemblage of quadrupeds, amongst which are those animals familiarly known as Opossums and Kangaroos. At the present period the great metropolis of the order is Australia; certain species of the group, however, are found in the Molucca Islands, and one genus, containing many species, is peculiar to the New World, and although chiefly confined to the tropical portions, is met with as far north as the United States (where, however, one species[3] only is found), and extends in the southern direction to Buenos Ayres[4], on the east side of the Andes, and Valparaiso on the west[5]. The species found in the islands north of Australia (if we except New Guinea) all belong to one genus (Phalangista), which occurs likewise in Australia, but they agree amongst each other in having the fur short, dense, and crisp, and the tail with the apical portion naked, and studded with fleshy warts,—characters which, in the opinion of some naturalists, entitle them to the rank of a subgenus to which the name *Cuscus* is applied. No Phalan-

[1] In some marsupialia (such as the true Opossums and the Dasyuri), even the corpora quadrigemina, or optic lobes, are not covered by the cerebrum.

[2] We learn from Prof. Owen's Papers that in the Marsupialia the right auricle of the heart has no trace of a *fossa ovalis*, or an *annulus ovalis*. In the Ornithorhynchus, Meckel found a deep, but closed, *fossa ovalis*. "Ad characteres supra dictos addantur. Uterus bipartitus; vagina, vel in toto, vel partim septo divisa; canales, et intestinales, et genitalis in cloacam communem recepti; maribus scrotum ante penem positum."

[3] *Didelphys virginiana.*

[4] *Didelphys crassicaudata*, and *D. brachyura.*

[5] *Did. elegans.*

gers presenting these peculiarities have been found in Australia. In the following table the names of the various species of *Cuscus* are arranged under those of the islands in which they occur.

Celebes.	Amboyna.	Banda.	Waigiou.	Timor.	New Guinea.	New Ireland.
ursinus	...	...	...	...	...	...
...	maculatus	maculatus	maculatus	...	maculatus	...
...	*chrysorrhos*	...	...	...	...	...
...	cavifrons	cavifrons	...	cavifrons	...	cavifrons.

In New Guinea the Marsupialia increase in numbers, since, notwithstanding its coast line is not yet completed on our charts, and the interior is almost unknown, seven species of marsupial animals have been discovered in that island, and these appertain to six distinct genera, one of which only, it must be observed, is peculiar to New Guinea[1]. Of the species, five are peculiar; one is said to be identical with a species found in New South Wales[2], and the seventh is the *Cuscus maculatus*, included in the above table.

With respect to the Marsupialia inhabiting the continent of Australia, it will be seen, upon consulting the observations on the habits and ranges of the species given under their respective heads, that, *generally*, species which are very nearly allied, and have very nearly similar habits, are not associated together in the same limited district. Of four nearly allied species of Kangaroos, which, from their habits, are called

[1] The genus Dendrolagus.

[2] *Petaurus sciureus.*—Of this identification I cannot help feeling some doubt; the animal called *Petaurus sciureus* by M. Müller, in his table displaying the *geographical distribution of the Mammalia of the Indian Islands*, I think is more probably identical with the *Pet. ariel* of Gould, a nearly allied species found in North Australia.

rock-kangaroos, and which constitute the little section *Petrogale*, one inhabits the hills of New South Wales, a second is found on the opposite side of the continent, a third has only been met with on the south coast, and the fourth on the north-west coast.

Many similar cases might be noticed. No doubt, in a large district, such as New South Wales, are found several species of the same section, as, for instance, the section *Halmaturus*: but of the several species of *Halmaturus*, or Brush-Kangaroos, inhabiting that portion of Australia, we learn from Mr. Gould that they each affect different minor districts. Some are fitted for one kind of scrub, and some for another; some prefer the swamps, and others the high table land; such a difference of habits is observed in the two species which are most nearly equal in size and power—the *H. ualabatus* and the *H. ruficollis* of Gould.

Viewing the Marsupialia as an order, it is one which presents a remarkable diversity of structure (and, consequently, habits), containing herbivorous, carnivorous, and insectivorous species: indeed, we find amongst the marsupial mammals analogous representations of most of the other orders of Mammalia. The *Quadrumana* are represented by the Phalangers, the *Carnivora* by the Dasyuri, the *Insectivora* by the small Phascogales, the *Ruminantia* by the Kangaroos, and the *Edentata* by the Monotremes. The *Cheiroptera* are not represented by any known marsupial animals, and the Rodents are represented by a single species only; the hiatus is filled up, however, in both cases, by placental species, for both Bats and Rodents are tolerably numerous in Australia, and, if we except the dog, which it is probable has been introduced by man, these are the only placental mammalia found in that continent.

The most striking peculiarity in the marsupial animals consists in the premature birth of their young, and consequently the imperfect state of development which they

present at this period. The young of the great Kangaroo (Macropus major), which Professor Owen examined twelve hours after birth, "resembled an earth-worm in the colour and semi-transparency of its integument, adhered firmly to the points of the nipple, breathed strongly but slowly, and moved its fore legs when disturbed. The body was bent upon the abdomen, its short tail tucked in between the hind legs, which were one-third shorter than the fore legs; but with the three divisions of the toes more distinct. The whole length, from the nose to the end of the tail, did not exceed one inch and two lines[1]." The young of a species of Kangaroo (probably the *Halmaturus Derbianus*), described by Mr. Collie[2], that gentleman states was also perfectly naked; its size was nearly equal to that of the last and half of the middle joint of one's little finger.

Four days after the birth of the young Kangaroo, Professor Owen, being anxious to decide the nature of the connection between it and the nipple of the parent, and to ascertain whether so small a fœtus would manifest the powers of a voluntary agent in regaining the nipples, detached it, and, after two days, upon again examining the pouch, he found it empty; every portion of the litter was carefully examined, in hopes of finding the fœtus, but without success, and it is supposed that, owing to the young being disturbed, the mother had destroyed it. A similar experiment was tried by Mr. Morgan[3], on a fœtus about the size of a Norway rat, and which, after two hours' separation from the nipple, regained its hold, and sustained no injury from the interruption of the supply of nourishment. A young Kangaroo, born in the managerie of Sir Robert Heron, and which is described as being perfectly naked, having accidentally got out of the

[1] Philosophical Transactions, Part 2 for 1834.
[2] Zoological Journal, vol. v. p. 239.
[3] See Transactions of the Linnean Society, Part 2. for 1834.

pouch of the mother, and which was scarcely alive when pointed out to the keeper, was first fed with some milk, and afterwards restored to the pouch of the parent, where, five days after, it was found to be alive and apparently in a healthy condition[1].

An animal so little advanced at the time of its birth as the young marsupial, requiring a constant supply of food, and so ill fitted to bear the exposure which the more advanced young of other Mammalia are subject to, must, it would appear, perish, were not some peculiar provision for its safety provided, and in the pouch of the female marsupial animals we find such a provision. This pouch, when the animal is very young, has its orifice closed, and glued, as it were, to the body of the parent by a peculiar secretion. When the young animal is more advanced, this secretion disappears, and the young frequently leave the pouch to return at will: they do not entirely quit the pouch until they have attained a large size, as compared with the parent.

Closely connected with the pouch, and with the generation of the animals of the present group, are the marsupial bones which so peculiarly characterize it. These bones are even more constant than the pouch, being found in the Echidna and Ornithorhynchus, in which no traces of the pouch have been discovered; and in some of the Opossums, in which the pouch is only represented by two small folds[2].

The marsupial bones are elongated and more or less flattened, widely separated at their distal extremity, and converging as they approach the pubis to which they are joined:

[1] The particulars of this case will be found in a letter addressed to the Secretary of the Zoological Society, by Sir Robert Heron, in the Proceedings of that Society for July, 1840.

[2] The *Thylacinus cynocephalus* affords the only exception, hitherto found, of a marsupial animal in which the marsupial bones are wanting; at least they are here only represented by two cartilages.—See observations on this subject by Prof. Owen, in Proceedings of the Zoological Society, for Dec. 1843, p. 148.

they are found in both sexes of the marsupial animals; are relatively longest, straightest, and most slender in the Perameles; flattest, broadest, and most curved in the Koala,—sometimes, as in the Wombat, they are articulated to the pubis by two points. Around these bones the cremaster muscle winds, and they serve important purposes in relation to the generative economy of the Marsupiata "In the female they assist in producing a compression of the mammary gland necessary to the alimentation of a peculiarly feeble offspring, and they defend the abdominal viscera from the pressure of the young, as these increase in size during their mammary or marsupial existence; and still more when they afterwards return to the pouch for temporary shelter[1]."

One of the most interesting features in the skull of the Marsupiata consists in the permanent separation of the bones; these do not anchylose in the adult and old animals as do many of the bones (especially those of the cranial portion of the skull) in the placental series: the temporal bone generally presents a permanent separation of the squamous, petrous, and tympanic elements. "I have observed," says Professor Owen, "this reptile-like condition of the bone in the mature skulls of an Ursine Dasyure, a Virginian Opossum, a Perameles, in different species of Potoroo (or Kangaroo-rats) and Kangaroo, in the Wombat and in the Koala." The palatine portion of the skull is generally very imperfect, presenting large openings. In all the species of the group, with the exception of the Echidna, Ornithorhynchus, and Tarsipes, the angle of the jaw is bent inwards, so that in viewing the underside of the jaw each ramus presents a more or less flattened and pointed process encroaching upon the interspace of the two branches behind, whilst in the

[1] See Professor Owen's paper on the *Osteology of the Marsupialia*, in the Proceedings of the Zoological Society for 1838.

placental mammalia the angle of the jaw is almost invariably on the same plane with the horizontal ramus.

In addition to these points of distinction between the placental and implacental or marsupial animals, there are others which are derivable from the number of the teeth. In the placental mammalia the normal number of incisors in both jaws is six, and of the true molars three on each side of each jaw, whilst in the present group no species has yet been found possessing six incisors in each jaw; the highest number found is in the Opossums of America, where there are ten in the upper jaw and eight in the lower: next follow the Dasyuri, in which they are eight above and six below; and in a great number of the species, as in the Kangaroo tribe, there are six above and two below. With the exception of the Wombat, which has two above and the same number below (as in the Rodents), there is no marsupial animal known possessing an equal number of incisors in the upper and lower jaws. With the exception of the edentate species of Marsupials, or those which are nearly edentate, like the Tarsipes; and also excepting the Myrmecobius, all marsupialia possess four true molars; that is, four molar teeth on each side of each jaw, which have never replaced other teeth in the vertical direction—a number not clearly made out to be found in any other group of quadrupeds, but possibly may prove to exist in the insectivorous quadrupeds forming the genus *Centetes*.

With regard to the structure of the molar teeth, they often correspond with the same teeth in the ordinary mammalia; when much complicated, as in the herbivorous, and especially the insectivorous species, they present the four principal cusps, as in the placental herbivora and insectivora. In the Kangaroo-rats, these four cusps or tubercles are distinct, but in the true Kangaroos the anterior and posterior pairs are joined, so as to present, before they are worn, two transverse sharp ridges. Besides the four principal cusps, complicated molar teeth have

frequently a band or projecting ridge, more or less perfectly encircling the tooth at the base of the exposed portion, and this band throws up small tubercles in parts; frequently on the outer side of the tooth a small tubercle is thrown up from the anterior angle of the tooth, a second tubercle in the middle, and a third at the posterior angle. By the development or non-development of one or more of these parts, most of the varieties observed in complicated molar teeth may be explained; and in my descriptions I shall endeavour to trace and point out these modifications in the different genera.

Of the affinities of the various minor groups of which the order Marsupialia is composed, with the exception of one or two cases, there can be very little difference of opinion; the modifications of the extremities, combined with the characters furnished by the digestive system, very clearly indicate the natural divisions, and their relationship to each other.

In the structure of the stomach, Professor Owen points out three leading modifications[1]; it is simple in the genera *Didelphys*, *Myrmecobius*, and *Perameles*, and likewise in the *Dasyurus* and *Phalangista* groups; also simple in the Koala and Wombat, but in these two animals it is provided with a glandular apparatus situated to the left of the cardiac orifice; the third modification is exhibited in the Kangaroo section, where it is complicated by sacculi. The small intestine commences with a cœcum in all the groups with the exception of the *Dasyuridæ;* the cœcum, according to Professor Owen, is moderately long in the *Myrmecobius*, *Perameles*, and *Didelphys,* very long in the *Phalangistidæ* (including the Koala), long in the *Macropodidæ*, and short, wide, and with a vermiform appendage, in the Wombat. Setting aside the Monotremes, we find one type of dentition exhibited in the car-

[1] See the article "Marsupialia," in Todd's Cyclopædia of Anatomy and Physiology.

nivorous and insectivorous species, in which there are more than six incisors in the upper jaw, distinct canines, and at least two false molars on either side of each jaw: a second type is presented by the Kangaroo group, where the canines are wanting, or very small, and there exists but one false molar on each side of the jaw; from these latter herbivorous species should be separated the Wombat, in which the molar and incisor teeth differ in being rootless, and the latter are reduced in number as before stated. But we have yet to notice another large group, the *Phalangistidæ*, in which we find the teeth presenting intermediate conditions to the two great sections just mentioned; they differ from the first section in having but six incisors in the upper jaw, and in having the two foremost incisors of the lower jaw very large and nearly horizontal, and the others rudimentary or wanting; there is also considerable difference in the form of these teeth. From the second section they differ in the structure of the molar teeth, as will hereafter be pointed out, and (with one exception only —the Koala) in having more than one false molar to each side of each jaw.

In the various species composing the sections noticed in the following Table, wherever the inner toe of the hind foot is developed, it assumes the form of a thumb, and is opposeable to the other toes, and thus gives a prehensile power to the hind foot, adapting it to climbing: hence we find the thumb developed in all climbing species, whether carnivorous, insectivorous, or herbivorous; but in the ground-inhabiting species of each of these sections, the inner toe of the hind foot is reduced to a rudimentary condition, or wanting; in both the herbivorous and animal-feeding groups, however, we find a gradual transition from the thumbless to species possessing a well-developed thumb. In the *Didelphidæ*, for instance, the thumb is in many well developed; in others it becomes very small, as in some of the *Dasyuridæ*; and in this last men-

tioned group we find a tolerably distinct thumb in the Phascogali, a rudimentary thumb in the *Dasyurus macrourus*, no external thumb in *D. Maugei;* but here the internal metatarsal bone exists; and, lastly, this metatarsal bone is absent in the *Thylacinus*. In the herbivorous group, we find the intermediate stages in degradation of the hind foot, in passing from the *Phalangistidæ* through the *Peramelidæ*, to the Kangaroo group.

The principal modifications of the extremities are expressed in the following Table:—

I. Second and third toes (counting the toe corresponding to the great toe as the first) free.	
A. Thumb to the hind foot very small, or wanting	DASYURIDÆ. Mymecobius.
B. Thumb distinct	DIDELPHIDÆ.
II. Second and third toes of the hind feet slender, and united in a common integument.	
A. *The four limbs of nearly equal length;* the hind feet short, and furnished with a distinct opposeable thumb	PHALANGISTIDÆ. Phascolomys.
B. The fore limbs distinctly shorter than the hind, which are much developed—the foot long.	
a. Hind foot having an inner metastarsal[1], and sometimes one, and even two[2], of the phalanges of the thumb, or inner toe; fore feet with the outer toes rudimentary and nailless, or wanting . . .	PERAMELIDÆ.
b. No inner metatarsal bone; fore feet with all the toes well developed, and having claws	MACROPODIDÆ.

The mutual relations of the different genera of marsupials,

[1] Chœropus, no doubt, forms an exception.

[2] Professor Owen has observed a second phalanx to the inner toe of the hind foot, of a species of Perameles, the terminal phalanx being divided by a longitudinal fissure at the extremity, as in the nail-bearing phalanges of the other toes. This is remarkable, since such a structure would lead one to suppose the inner toe in this animal had a nail: in no marsupial have I yet met with a nail to the inner toe in question.

as indicated by the above structural characters, may be symbolically expressed by arranging them in the following manner:—

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                                  Thylacinus
                                      -
                                      -
                                  DASYURUS
                                      ..
                 DIDELPHYS - - -
                                      -
                                  Phascogale - - MYRMECOBIUS - - MONOTREMATA
                                      -
                 PERAMELES            -
                      - - - - - - -
                      -               -
                      -               -
                      -               -
                      -            Dromicia            Acrobata - - - TARSIPES
                      -               -                    -
                      -               -                    -
                Hypsiprymnus       Pseudocheirus        Belidea
                      -               -                    -
                      -               - - - - - - - -
Lagorchestes    Bettongia          PHALANGISTA          Petaurus
       -              -               -
       -              -               -
       -        Dendrolagus        Cuscus
       -              -               -
       - - - - - - - - - - - - - -
       -        Halmaturus         Phascolarctus
       -              -               -
       -              -               -
       -        Petrogale             -
       -              -               -
       -              -               -
MACROPUS        Osphranter            -
                                      -
                                   PHASCOLOMYS.
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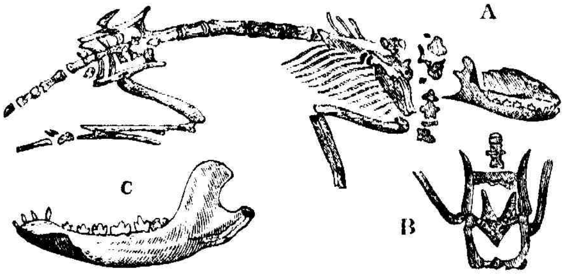
Remains of marsupial animals have been found in Europe, Australia, and South America. In the caverns which occur in the calcareous rocks in the interior highlands of Brazil, the bones of the small opossums are very numerous, but these are for the most part very nearly allied to, if not absolutely identical with, species still living in Brazil. In Europe, the most authentic remains of marsupial animals are those found in the gypsum quarries of Montmartre; the greater portion of a skeleton (fig. A), in which the marsupial bones remain in their

natural position with regard to the pelvis (fig. B), in which the



lower jaw presents the angular portion curved inwards, and in which the molar teeth correspond precisely with those of the genus Didelphys[1], leaves no doubt as to the existence of marsupial animals in Europe in the Eocene geological period: besides this Opossum-like animal, a lower jaw found in the same quarries has been referred to the marsupial group—it forms the genus Pterodon of De Blainville: a small fragment of a lower jaw, having a single false molar in situ, found in the London clay formation, near Woodbridge, in Suffolk, is supposed by Mr. Charlesworth[2] to have appertained to an animal of the marsupial group; I do not believe, however, that satisfactory evidence of the affinities of a quadruped can be deduced from such scanty materials. In formations considerably lower in the series than the Eocene—in the Stonesfield oolite—have been found several rami of lower jaws of small Insectivorous Mammalia, some of which, in their general form, and in the dentition which they present, approximate very closely to the Insectivorous Marsupialia; these, however, cannot, with propriety, be arranged in any known recent group of Marsupialia; they form the genera *Thylacotherium*, or *Phascolotherium*, of Professor Owen. To the latter genus belongs the

[1] See Cuvier's Ossemens Fossiles, 4to. ed. 1822, tom. iii. p. 284, plate 71.
[2] Magazine of Natural History for September 1839, p. 540.

Didelphys Bucklandi of Mr. Broderip, founded upon a very perfect ramus of a lower jaw (fig. c) presented by that gentleman to the British Museum.

The marsupial remains found in Australia are chiefly from the caverns of Wellington Valley, New South Wales. A considerable collection of these remains was formed by Major (now Sir T. L.) Mitchell, and are described in that gentleman's work[1] by Professor Owen. It appears, from the examination of these and other fossil mammalian remains from Australia, that they are referable, for the most part, to genera still presenting living species in the same country; there are some, however, which exhibit some very remarkable modifications of the marsupial structure, and form the types of new genera, which are noticed in their proper place.

Note on the rank of the section Marsupiata.

In the first edition of the *Règne Animal,* Cuvier treated the Marsupiata as a family of the order Carnivora; but, in the last edition, he forms an order of the marsupial animals, because, as he observes, they present so many singular features in their economy, and, above all, because they exhibit a kind of representation of three very different orders. But he immediately afterwards, apparently influenced chiefly by such considerations, states, that the group in question might be regarded as a *distinct class,* parallel to that of ordinary quadrupeds, and, in like manner, capable of being divided into orders.

In the most recently published classification of the Mammalia[2], the marsupial animals are regarded as a class, and are arranged parallel with the ordinary placental mammalia. By Prof. Owen, and some other naturalists, the present section is ranked as a subclass.

As considerable stress has been laid upon the correspondence of certain

[1] Three Expeditions into the interior of Eastern Australia, &c. by Major T. L. Mitchell, Surveyor-General.

[2] Mammifères: Classification parallèlique de M. Isidore Geoffroy Saint-Hilaire. 1845.

divisions of the Marsupiata to certain divisions of the placental mammalia, I will here show some of the comparisons which have been made, and I shall afterwards add a few remarks upon them.

The first parallel arrangement of divisions of Mammalia which follows, exhibits the views of Cuvier upon the correspondence of the groups of the placental and implacental series; next follows an illustration of those of M. Isidore Geoffroy, and lastly, of those of Prof. Owen.

CUVIER.

Marsupial.	*Placental.*
Didelphys . Dasyuridæ . Peramelidæ .	Insectivora part.
Phalangista . Hypsiprymnus	Insectivora part.
Phascolomys .	= Rodentia.

ISID. GEOFFROY.

Dasyuridæ . Didelphidæ . Peramelidæ . Myrmecobius . Tarsipes .	Carnivora. Insectivora.
Phalangistidæ . Macropodidæ . Phascolomys .	Rodentia.

OWEN.

Marsupial.	*Placental.*
Thylacinus . Dasyurus .	Carnivora.
Phascogale . Myrmecobius . Perameles .	Insectivora.
Didelphidæ . Phalangistidæ .	Quadrumana.
Phascolarctus .	American Sloths, or Arboreal Sun Bears.
Phascolomys .	= Rodentia.
Petaurus .	= Pteromys.
Macropus .	= Herbivora.

From an inspection of this list, it would *appear* that the groups of the placental mammalia are by no means strongly typified by those of the implacental series, or there would be a greater amount of correspondence in the views of these authors. Nevertheless, certain marsupial animals present a very striking resemblance in general appearance, and in the functions they perform, to certain sections of the ordinary Mammalia, and I perfectly agree, so far, in the justness of the comparison instituted by Prof. Owen between the carnivorous and insectivorous Marsupialia, and the carnivorous and insectivorous Placentalia. The herbivorous marsupials permit, in the same manner, of a tolerably close comparison with the higher herbivorous groups. Admitting these points of correspondence between the two so-called parallel classes of Mammalia, I cannot agree with Cuvier and Isidore Geoffrey St.-Hilaire if they educe from them grounds for raising the Marsupiata to the rank of a class parallel to the ordinary

Mammalia. Such an interpretation cannot be made of these analogies, for in so doing we must admit that those groups of Marsupialia, which typify the orders *Carnivora*, *Insectivora*, *Rodentia*, &c., are groups of equal *rank* to the orders they typify, and if we carry our analogies further, we shall find that such a view will be by no means borne out. For instance, in the structure of the brain, there is so much difference between the placental *Insectivora* and the *Carnivora*, that many naturalists do not admit of these two sections being arranged *near* to each other, and by almost all who have recently treated of the classification of the Mammalia, the Insectivora and Carnivora are admitted to be distinct orders. Now if the order *Carnivora* is represented by *Thylacinus* and *Dasyurus*, and the order *Insectivora* by *Phascogale*, *Perameles*, &c. almost the only point of distinction between the carnivorous and insectivorous marsupial groups consists in a slight difference in the structure of the teeth![1] Geoffroy, who established the genus Dasyurus, regarded the type of Temminck's genus *Phascogale* as a member of that genus; and Professor Owen, as well, I may say, as every mammalogist whose labours I am acquainted with, regard *Phascogale* and *Dasyurus* as members of the same *family*: how then can two species of the same family represent in rank two orders? Again, upon a careful examination of the Wombat, I find so many points in common with the Phalangista group—that it is so intimately related to the Koala (which is more clearly an aberrant Phalangista), as indicated by the structure of the stomach, and the deficiency in the number of the false molars, and the total absence of tail—that I am inclined to regard the genus *Phascolomys* as presenting an aberrant form only of the *Phalangistidæ*: that the thumb should be reduced to a small size in this animal, which differs from others of its (supposed) family, in living upon the ground, I am prepared for, since in the *Dasyuridæ* the same thing takes place under similar circumstances. I am also prepared to find in an herbivorous group like the *Phalangistidæ* a difference in the structure of the molar teeth—in having them rooted in one case and rootless in another, for such happens in other herbivorous groups of Mammalia. Can I, then, regard the Wombat as constituting one order of Mammalia, and the Phalangers another, and at the same time suppose the one to represent the highest group of placental mammalia (Quadrumana) and the other the *Rodentia*, which is one of the lowest?—might we not regard the last-mentioned group (*Rodentia*) as a class, because the *Sciuridæ* typified the *Quadrumana*, and the *Muridæ*, in their comparatively carnivorous habits, represented the *Carnivora*, the Agoutis the *Ruminantia*, and, lastly, because the Capibara quite as strongly typified the *Pachydermata* as does the Wombat the Rodentia. The analogies are here

[1] In stating this, it must be observed, I am comparing *Phascogale* with the *Dasyuri*, in which I include *Thylacinus*. *Perameles* differs *much* more from *Phascogale* than does that genus from *Dasyurus*.

sufficiently evident, as it appears to me, though not so striking as in the Marsupiata, but this may, I think, be accounted for.

Let us compare the Marsupiata, and the sections of which it is composed, with the Placentalia, in another point of view. In those groups which are universally admitted to be *orders*, there are most frequently very many species, and, what appears to me of more importance to notice, there are in each order many genera and several families. Sometimes, where an order does not contain many recent species, the comparatively few species present very striking modifications of structure, as is the case with the order *Edentata*: here, however, we know that a great portion of the species have become extinct, as well as in the order *Pachydermata*, which presents a similar condition, having but few recent species, and those exhibiting striking modifications of structure: then, again, we find that the groups admitted to be orders have representatives in widely separated portions of the globe, and not only each order is widely dispersed, but frequently the principal genera of which each is composed, and from which the other genera appear to radiate, have (or had) an almost universal distribution[1]. Some orders do not present all these conditions, not containing several genera of universal distribution, but all evince an *approximation* to them; and it is amongst those orders which fall short (if we may so speak) of these conditions, that we find the nearest approximation to parallelism to the *Marsupiata* as regards geographical distribution. The *Edentata*, like the *Marsupiata*, are found in both hemispheres; each of these divisions, however, has its chief metropolis in one hemisphere; both, low in grade of organization, are driven down, as it were, into the southern portions of the globe, but have existed in former times in the northern hemisphere. Both include species exhibiting very marked variations in structure and of habits. But the *Edentata* are correctly, as I think, regarded by most naturalists as forming an order.

When, on the one hand, we find the conditions presented by the principal divisions of the Marsupiata approximate most nearly to those of families of other orders, being separated from each other by comparatively trivial characters, and that the whole group presents the strongest anology to other groups which are regarded as orders, with respect to their geographical distribution, we are warranted, *cæteris paribus*, in regarding the Marsupiata as an order. But then it may be said, perhaps, that the amount of differential characters which serve to separate the Marsupialia from other orders is greater than that by which those orders are distinguished. If it be true that each minor group of

[1] In the order CARNIVORA we find (having a nearly universal range) the genera *Canis*, *Felis*, *Mustela*, *Ursus*, and *Phoca*; in the RODENTIA, *Sciurus*, *Mus*, *Hystrix* (Linn.) and *Lepus*; in the PACHYDERMATA, *Mastodon* (fossil), *Tapirus* (and its allies, found only in a fossil state), *Equus* (either recent or fossil), and *Sus* (Linn.)

Mammalia presents species of comparatively high and others of lower grade of organization, and I think it very certain, then should we be prepared to find, in the lowest *order* of the class, a great amount of difference, as compared with the higher orders, in those characters which, as they approximate to, or deviate from, a certain standard, are said to indicate a higher or lower grade in the scale of organization.

Now it is precisely in such characters that the most important distinctions of the section *Marsupiata* are manifested; and the raising that group to a rank above an order, is to admit that the amount of difference is greater than could be, *à priori*, anticipated in the lowest order of a class; and yet this most important branch of investigation has not, to my knowledge, been considered. It remains to be inquired whether there is not an increase in the ratio of the amount of differential characters as we descend in the scale, and whether there may not be an increase in the amount of variation exhibited in the species of the lowest division of any great group. There are not only grounds for believing such to be actually the case, but I think the embryologist would be prepared to account for some of these points—partly, perhaps, by the more rapid changes in the metamorphoses which a high animal undergoes in the earlier stages of its existence.

In the foregoing pages I have not alluded to the *Monotremata*, for although it is generally admitted that that group possesses a relationship to the *Marsupiata*, the nature of that relationship can only be determined by such investigations as I have above alluded to. If the views which are hinted at in this note[1] be well grounded, then is the *Monotremata* a family of the order Marsupiata.

SECTION I.—MONOTREMATA[2].

Mammalia possessing marsupial bones, wanting the corpus callosum to the brain, with the mass called *corpora quadrigemina* divided by a transverse fissure, and with the posterior part undivided: the sternum and shoulder bones joining, and encircling the fore part of the trunk: the sternum with the manubrium joined in front by an episternum, which is produced on each side at its anterior extremity into a long branch, attached to and

[1] I see no reason why similar considerations should not be brought to our aid with a view to determine the rank of the section Amphibia among Reptiles, about which there has been so much discussion.

[2] From μόνος, unicus; τρῆμα, foramen.

running along the upper surface of which is the clavicle; the space below the lateral branches on either side almost entirely occupied by a large flattened epicoracoid, which is bounded on the outer side by a coracoid bone: the jaws edentate, or provided with crushing teeth of a horny nature. The mammary glands abdominal, in the form of numerous elongated subcylindrical lobes, converging and opening into a small oval areola, which has not been seen to form a projecting nipple; cœcum small; facial bones produced and covered by a hairless skin; ear without any external concha; young (in Ornithorhynchus at least) naked.

The section Monotremata contains but two well-determined species, both of which are from Australia, and were originally described by Dr. Shaw towards the close of the last century,—the one under the name of *Myrmecophaga aculeata*, and the other under that of *Platypus anatinus*. The former, in many modern systematic works, appears under the name of *Echidna hystrix*, and the latter with the name *Ornithorhynchus paradoxus*,—a name first applied, in 1800, by Blumenbach.

An animal presenting such a remarkable combination of characters as the Ornithorhynchus, could not fail soon to attract the attention of the anatomist and physiologist, and since it was soon discovered to approach the oviparous classes of birds and reptiles in many of its characters, a question arose as to whether, like the Mammalia, it suckled its young, or, like the other two classes just mentioned, was oviparous.

Even after the Ornithorhynchus had been carefully dissected by Meckel[1], that able anatomist, who had discovered and well described the mammary glands, still doubted whether the animal might not lay eggs, inasmuch as the generation of the *Marsupialia* closely resembled that of the oviparous

[1] See his *Ornithorhynchi paradoxi descriptio anatomica*, folio, 1826; and *Beitrage zur Vergleichenden Anatomie*, 1808.

classes; and, on the other hand, as birds have been known to hatch the eggs within their body, and to give birth to a living chick, he thought it highly probable that the generation of the Ornithorhynchus, approaching still more nearly to birds and reptiles than the Marsupialia, might be oviparous. Geoffroy St.-Hilaire, Oken, De Blainville, and Prof. Owen, took active parts in the discussion of this question: the former supposing the mammary glands were wanting, removed the Ornithorhynchus from the class Mammalia, and arranged it, together with the Echidna, in a separate class, to which he affixed the name *Monotrema*[1]; and, subsequently, when Meckel had shown the existence of the glands in question, Geoffroy St.-Hilaire still firmly maintained his opinion[2]. These glands he conceived to be analogous to those situated along the flanks of the salamanders, or to the odoriferous glands observed on the sides of the abdomen in shrews. At an early period, De Blainville rightly conjectured that mammary glands would be found in the Ornithorhynchus, and that the animal would prove to be allied to the *Marsupiata*[3].

In two Memoirs published in the Philosophical Transactions[4], and a third paper published in the Transactions of the

[1] *Anatomie Philosophique*, tome i. 1818. Sir Everard Home, it must be observed, had previously pointed out the close relationship of affinity which existed between the Ornithorhynchus and Echidna, and called particular attention to various peculiarities in the sexual organs of these animals.—See his paper, On the Anatomy of the Ornithorhynchus, in the Philosophical Transactions for 1802, vol. 92, p. 67; and on the Ornithorhynchus hystrix, loc. cit. p. 348.

[2] See *Annales des Sciences Naturelles*, 1826, p. 457.

[3] An excellent summary of the interesting controversy relating to the mammary glands, &c., of which an outline only is here given, will be found in the article *Ornithorhynchus*, in the Penny Cyclopædia, from the pen of Mr. Broderip.

[4] On the Mammary Glands of the *Ornithorhynchus paradoxus*, Phil. Trans. 1832, part 2; and on the Ova of the *Ornithorhynchus paradoxus*, Phil. Trans. 1834, part 2.

Zoological Society[1], Professor Owen has thrown much light on this interesting subject:—the discovery of the mammary glands, by Meckel, has been confirmed, and a great amount of evidence is brought forward tending to prove that the Monotremata are allied to the *Marsupiata*, and are essentially ovo-viviparous mammals,—that they bring forth living young,—and that these are suckled by the parent.

Prof. Owen and some other authors agree in regarding the *Monotremata* as forming a distinct order of the class Mammalia and subclass Marsupiata,—an order which presents the lowest grade of organization among mammals, and which approaches most nearly to the oviparous classes of birds and reptiles.

The most essential characters of the group are strictly anatomical, and we must content ourselves here with a mere notice of some among the more striking points. The Monotremata, observes Prof. Owen, are allied to the Marsupiata by the absence of the *corpus callosum*, and by the presence of the marsupial bones, but differ in the absence of the abdominal pouch, and in not possessing teeth; in the simplicity of the bigeminal bodies, and in some remarkable modifications of the skeleton and generative organs.

The *corpus callosum*, it may be necessary to explain, is a portion of the brain which forms a kind of band connecting the two hemispheres of the brain, and that its presence was regarded as peculiarly characteristic of the mammalian order (it being absent in birds and reptiles, &c.), until Prof. Owen discovered that this band was wanting in the *Marsupiata*. The bigeminal bodies also form part of the brain, and come into view immediately upon separating the hinder part of the great hemispheres. In ordinary quadrupeds, the mass, here called bigeminal bodies, is divided by a transverse and a

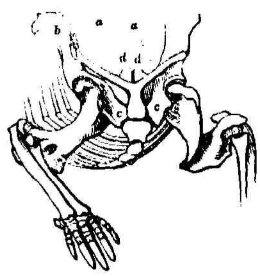
[1] On the Young of *Ornithorhynchus Paradoxus*, Trans. Zool. Soc. vol. i. p. 221.

longitudinal groove into four parts, called *corpora quadrigemina;* in the Monotremata, the same mass is divided in the transverse direction; the anterior portion is also indistinctly divided by a longitudinal groove, but the hinder portion, which is much smaller, is undivided, and thus forms a single transverse band.

In the skeleton, one of the most striking peculiarities, as compared with other mammalia, is displayed in the structure of the chest and blade-bones: these together (in the Ornithorhynchus), form a ring encircling the fore part of the body; the upper part of this ring is formed by the two scapulæ, or blade-bones, and the fore, or under part, by the chest-bones. These latter, *sternal*, bones, are five in number: the foremost (the episternal) is a broad flat bone, considerably expanded at the lower extremity, and throws out, nearly at right angles, a long slender branch on each side at the anterior extremity. The second (the manubrium sterni) is also a broad flat bone, and of a triangular form; the three following, posterior, bones are very narrow. We have next to notice the clavicles, which are here long and slender bones, nearly meeting in the mesial line of the chest, and as they are extended outwards to the shoulder, are joined to, and run parallel with, the upper part of the T-shaped episternal bone. Lastly, in the chest, are four other bones; the two coracoid, and the two epicoracoid bones: the former are joined to the scapular bones, and as they run downwards, converge and meet the lower extremity of the episternal bone. The epicoracoids are flat, broad bones, which nearly occupy the whole of the interspace between the coracoids and the episternum; they partially overlap the inner side of the latter bone[1]. In

[1] In the above description of the shoulder and chest of the Ornithorhynchus, the author has followed Professor Owen's views, as regards the signification of the various bones.—See the article *Monotremata,* in Todd's Cyclopædia of Anatomy and Physiology.

this structure of sternum and shoulder, we perceive an approach to the Birds; and there is a still greater resemblance in these parts to the Lizards and Ichthyosauri, as is pointed out by Prof. Owen. The sternum and shoulder bones are *essentially* upon the same model in the Echidna[1].



Sternum of the Echidna.

a. a. The two lateral processes of the episternum, along the upper surface of which are attached the clavicles.
b. The scapula, or blade-bone.
c. c. The coracoids.
d. d. The epicoracoids.

[1] For a detailed account of the anatomy of the Monotremata, we must refer our readers to the able article under that head, by Prof. Owen, in Todd's Cyclopædia of Anatomy and Physiology.

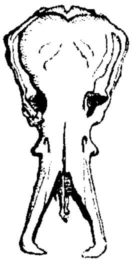
Genus ORNITHORHYNCHUS. Blumenbach.

Platypus, SHAW, Naturalists' Miscellany, vol. x. Plates 385 and 386. Dated June, 1799.
Ornithorhynchus, BLUMENBACH; Voigt's Magaz. ii. 1800.
Dermipus, WIEDEMANN, Archiv. für Zoologie, &c. i. 1800[1].

BODY depressed, nearly oval, and clothed with a dense fur; head with the facial portion elongated, and forming a broad and depressed beak-like snout, covered by naked skin, which is produced into a lappet-like fold at the base of the snout: eye small: upper and under jaws furnished on each side, and towards the front, with a long narrow horny appendage; and towards the hinder, with a broad, nearly ovate, crushing tooth of the same horny substance: tongue short, and provided in parts with horny papillæ: legs short; the feet fitted for swimming; each foot with five well-developed toes, between which a membrane is extended—in the fore foot the membrane is produced considerably beyond the toes; claws of the fore foot large, solid, and depressed, and fitted for burrowing: tail rather short, broad, and depressed: stomach with the cardiac and pyloric orifices closely approximated; cœcum small. The male sex provided with a spur to hind foot.

[1] The name *Platypus* of Shaw, being the first published, would be here adopted, but that name had been previously applied to a genus of Insects. The name *Ornithorhynchus*, which is universally adopted, has reference to the bird-like snout of the animal; being from the Greek words ὄρνις, a bird; and ῥύγχος, a snout. The other two generic names were suggested by the peculiarities of the foot: *Platypus* is from πλατυς, broad; and ποῦς, the foot; and *Dermipus* is from δέρμα, skin; and πους—in allusion to the feet being webbed.

of a bright-brown hue on the upper parts of the body, and whitish on the under parts. When from two to four inches in length only, the beak is proportionately much shorter than in the adult (being shorter than the head), and the body is destitute of hair.



Skull of the Ornithorhynchus.

The skull of the Ornithorhynchus is much elongated, and has the facial portion remarkably produced and depressed, and, owing to the divergence of the superior maxillary and intermaxillary bones, is expanded in front. A stright line lying lengthways on the mesial portion of the upper surface of the skull, would touch very nearly at every part, from near the occiput to the anterior boundary of the facial bones. The temporal fossæ are narrow, and the orbits are of moderate size; the zygomatic arch is deep and moderately long, and sends up a post-orbital process; the zygoma appears to be formed entirely of meeting processes of the squamous portion of the temporal bone and superior maxillary. Professor Owen could find no malar bone either in the skull of a young Ornithorhynchus, or in that of an immature Echidna. The glenoid cavity for the lower jaw is concave in the transverse direction, and slightly convex from before backwards, and has no posterior descending process. The frontal bones are very small, and the parietals large. The sutures of the cranial bones soon become obliterated, and in this respect, as well as in their thinness and density, remind us of the skull of a bird. The nasal bones are large, and much extended in the longitudinal direction. The superior maxillaries are greatly expanded immediately under the anterior root of the zygoma, to give support to the large horny molar teeth, and are continued forwards, on the outer side of the intermaxillaries, to within a short distance of their apices. The intermaxillary bones are rather narrow, depressed, widely separated,

and suddenly bent inwards (but do not meet) at their extremity. The palate is of great extent.

The rami of the lower jaw are long, nearly cylindrical in the middle, but expanded to form the alveolus of the great horny tooth. Each ramus, viewed from the outer side, presents a slight sigmoid curve, being slightly arched in the middle, and having the condyloid portion curved gently upwards. The condyle is broader than long, broad externally, and narrow internally, and moderately convex. On the inner side of the ramus is a tubercle, situated about two lines behind the molar tooth, and which gives attachment to the internal pterygoid muscle; and on the upper surface of the jaw, nearly in a line with this tubercle, is a depression indicating the point of insertion of the temporal muscle; immediately under this point, on the outer side of the jaw, is a very large cavity, which runs inwards, and is suddenly contracted beneath the molar tooth. The dental canal is a large opening, and may be seen on the inner side of the jaw, under the posterior margin of the tooth: it has two outlets; one on the outer side of the jaw, in a line with the front of the tooth, and the other on the under side, at a short distance from the extremity of the jaw. The rami meet, and join immediately behind the last mentioned opening, but are loosely attached, and diverge again at the apex. The apical portion of the ramus is depressed, and exhibits a long shallow groove along the outer edge, in which the anterior narrow horny tooth is situated.

	Inches.	Lines.
Total length of cranium	3	11
Greatest width (which is at the hinder root of the zygoma)	1	9
Width between orbits	0	6
Width at the tip of the intermaxillary bones	1	1
Length of zygomatic arch	1	3

In a skeleton in the British Museum collection, I find the skull considerably larger than indicated by the above dimensions; it being four inches and two lines in length, and two inches in width behind. The lower jaw of this skull is three inches and ten lines long.

The vertebræ in the skeleton are fifty in number, of which 7 are cervical, 17 dorsal, 2 lumbar, 2 sacral, and 22 caudal. The cervical vertebræ, as Prof. Owen observes, are remarkable for having

the ribs separated for a longer period than usual from the body of the vertebræ, and in the axis vertebra the ribs are not anchylosed even in the adult animal[1]. In this character, as well as in the great number of dorsal vertebræ, and consequently ribs, we perceive one of the many points of approximation in the Ornithorhynchus to the Oviparous classes. The transverse processes to the caudal vertebræ are very broad, flat, and much produced: the tail is broadest near the middle, where its width in the skeleton before me is one inch and two lines, but the width gradually decreases from this point to the apex, in consequence of the gradual shortening of the transverse processes.

The humerus is a short, broad, and strong bone, and has the internal condyle perforated. The ulna and radius are in contact, and the former is remarkable for having the olecranon very suddenly expanded at the extremity. The hinder extremities are longer than the anterior, but the increased length is due almost entirely to the tibia and fibula, the femur being but little longer than the corresponding bone of the fore leg—the humerus. The fibula is remarkable for having the upper extremity continued considerably beyond the proximal end of the tibia, and with this free portion much expanded: a process is thrown out from the base of the expanded portion of the fibula to articulate with the tibia and femur.

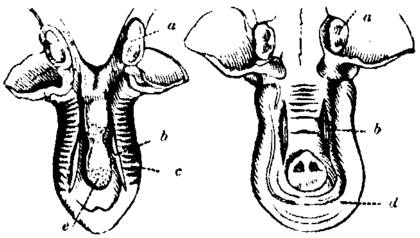
The Ornithorhynchus inhabits New South Wales and Van Diemen's Land, and is called by the colonists the Water-mole—a name suggested by its aquatic habits, combined with some slight resemblance which it bears to the common European mole. Were we, however, to institute a comparison between the Ornithorhynchus and any animal from other parts of the world, it would be with the Mygale of the Pyrennees, or the allied species which inhabits Russia: here the resemblance, both as regards external appearance and habits, is very considerable. The native names of our animal,

[1] I find the ribs of the axis vertebra unanchylosed in the skeleton in the British Museum collection, which is considerably larger than those in the College of Surgeons' collection, where the same peculiarity has been noticed by Professor Owen.

Mr. Bennett informs us, is Mallagong and Tambreet; but the latter is the most common appellation with the Aborigines of New South Wales.

The most striking feature in the structure of the Ornithorhynchus is the beak-like face; a peculiarity which suggested the generic name given by Blumenbach, and which, in combination with the broad flat foot, likewise suggested to Shaw the name Duck-billed Platypus, or *Platypus anatinus*. The head is rather small, but the facial bones are much developed, and, together with those of the lower jaw, form a framework which is covered with a thick naked skin. The beak is much depressed, about one-third longer than broad, and broader in front than behind: the skin with which it is covered is in the living animal of a greyish-black colour, and covered with innumerable pores; but both at the front and sides of the beak is a free portion of the skin, which is uniformly smooth and flexible.

FIG. 2. FIG. 1.



Jaws of the Ornithorhynchus.

Fore part of the upper and under jaws of the Ornithorhynchus, showing the inner side of the beak-like jaws.

FIG. 1. The upper jaw.
- *a*. The horny molar teeth.
- *b*. Long, narrow, anterior horny teeth.
- *d*. Free portion of the integument projecting from the jaw.

FIG. 2. The lower jaw.
- *a*. The horny molar teeth.
- *b*. Narrow, anterior horny teeth.
- *c*. Transverse ridges on the leather-like covering of the beak.
- *e*. The tongue.

In front of the beak, the free membrane (*d*, fig. 2) measures half an inch in width, and at the sides rather less. At the base of the beak the skin forms a kind of fold or lappet, which averages about half an inch in width; at the angle of the mouth it is narrower, but immediately below the angle its width is nearly three quarters of an inch. This fold falls back over the fore part of the head and throat, and no doubt serves to prevent the mud, in which these animals are constantly grubbing in search of their insectivorous food, from soiling the fur: it may also serve to protect the eyes both from the mud and from the soil, when burrowing in the ground. The nostrils are moderately large, and situated near the extremity of the upper surface of the beak. The lower mandibles are covered, like the upper, with a naked skin, but here it is generally of a whitish colour; the free, marginal portion is narrower, and on the upper surface it presents numerous transverse ridges, which may be compared to the ridges observed in the beak of a duck, and no doubt answers a similar purpose — that of sifting or straining the water from the materials collected in the mouth, which is moreover provided with two tolerably large cheek-pouches for their reception. "An air-breathing, warm-blooded animal, which obtains its food by the capture of small aquatic animals (observes Prof. Owen) while submerged, must derive great advantage from the structure which enables it to transfer them quickly to a temporary receptacle, whence they may be extracted and masticated while the animal is floating on the surface, or at rest in its burrow."

The teeth in the Ornithorhynchus, unlike those of most mammalia, are of a horny substance: they are eight in number; four are situated (one on each side of each jaw) in the fore part of the jaws, and are in the form of long and narrow strips, being about three-quarters of an inch in length, and $\frac{1}{12}$th of an inch in width: they present a slightly trenchant

edge, and are thus fitted for prehension: the other four teeth are of a somewhat irregular oblong oval form, about $\frac{8}{12}$ths of an inch in length, and $\frac{5}{12}$ths in width: the crown of these teeth is concave, but presents two transverse ridges; one near the middle of the tooth, and the other on the hinder part. These represent the grinder teeth, or true molars, of ordinary mammalia, and occupy the usual situation of such teeth; viz. immediately under the anterior root of the zygomatic arch. Besides these teeth, the Ornithorhynchus, in harmony with many other parts of its structure, presents a Reptilian character, in having horny teeth on its tongue; this is moderately long (terminating about half an inch from the end of the mouth), and has the upper surface of its anterior portion covered with minute papillæ; the hinder part is suddenly expanded, and at the same time is raised, and presents an acute angle in front, on which are observed a group of about six minute horny tubercles, and two others which are in the form of a depressed cone, and about $\frac{1}{12}$th of an inch in length. This bulb on the back part of the tongue would serve to prevent the passage of the materials collected in the mouth, together with the water, into the gullet, and to direct the former into those temporary receptacles, the cheek-pouches, which have their opening on each side, at the back part of the mouth[1]. The eyes are small, of a brown colour, directed somewhat upwards, and situated near the base of the beak. The external orifice of the ear is placed at a short distance behind the eye, and being hidden by the fur, is not easily found in the dead animal, though readily seen in the living, which has the faculty of closing or opening it at will. The legs are strong, and very short; the feet are provided each

[1] In two specimens of Ornithorhynchus obtained by Mr. Bennett, he found the cheek-pouches filled with mud and gravel; but in other cases their contents were found to consist of river insects, small shell-fish, &c.: these, however, were always mingled with mud or gravel.

with five well-developed toes; those of the fore feet are nearly equal in length; the inner toe, or thumb, is the shortest, and the outer one approaches this most nearly in length; they are furnished with long, broad, and somewhat depressed, solid claws, which are rounded at the extremity; not only are the interspaces of the toes webbed, but the web is extended about half an inch beyond the end of the claws, and thus gives great expanse to the foot when used for swimming; but when employed in burrowing, the free edge of the membrane is folded back. The toes of the hind feet are rather longer than those of the fore, and very nearly equal in length, if we except the inner toe, which is about one-third shorter than the others; the claws are long, curved, and pointed; the spaces between the toes are webbed, but here the web extends only to the base of the claws. On the heel of the male Ornithorhynchus, is a large and sharply-pointed moveable spur, which is curved upwards, and directed backwards: this spur is pierced by a minute tube, the outlet of which is near the point; and connected with this little tube is a large gland, which has been supposed by some to secrete a poisonous fluid, which is injected through the tube in question into any wound inflicted by the spur: but from all the evidence collected by Mr. Bennett, who tried various experiments upon himself, it does not appear that the supposition of the secretion being poisonous is well founded. A small rudimentary spur is found in the young female Ornithorhynchus; but this disappears when the animal becomes adult, and a small hollow marks its situation. The fur of the Ornithorhynchus is very dense, by no means long, and rather soft to the touch: it is composed of hairs of two kinds; the one is extremely fine and dense, and the hairs composing the outer fur, as it may be termed, are likewise fine, if we except that portion of each hair which projects beyond the under fur; these free points of the longer hairs are comparatively harsh, broad, and

lanceolate, and are very glossy, and bent at an angle with the slender basal portions of the hairs. In this character of fur we can perceive a beautiful adaptation both to the burrowing and aquatic habits of the animal; for, when burrowing, were the longer hairs equally stout from the base to the point, and directed towards the tail, as usual, they would incommode the animal when moving backwards in its burrow; but being slender at the base, and expanded externally, the points readily accommodate themselves to any surface with which they may come in contact, and laying flat on each other, serve either to keep the water or the soil from penetrating to the under fur. The general colour of the fur is deep brown, but on the under parts of the body it is somewhat paler: in the young animal the fur is of a brighter brown tint, and the under parts of the body are whitish. The tail is short, depressed, and very broad, and covered with coarse hairs; these, however, are generally worn off on the under side of the tail in adult or aged individuals, probably by the friction of the ground, since the animal's legs are too short to elevate the body. The toes of the fore feet are naked; those of the hind are clothed, very nearly to the extremity, with short, adpressed, glossy brown hair, and there is a fringe of stiff pale-coloured hairs on the outer side of the foot. The three middle toes of the hind foot are so united by the skin as to be capable of very little lateral separation; the membrane which joins the little toe to the others is more ample, and so is that which joins the thumb to the second toe; and here, instead of merely filling up the interspace between the toes, there is a fleshy lobe (Pl. 2, fig. 3, *c*.) of full half an inch in length, continued from the end of the thumb beneath, and to the end of which the membrane is extended.

We have quoted Mr. Bennett in some of our preceding pages. This gentleman is the author of a very interesting

account of the habits of the Ornithorhynchus[1], from which we shall proceed to make some extracts.

Mr. Bennett was so eager to obtain a view of the living Ornithorhynchus, after his arrival in Australia, that upon reaching a friend's estate at Mundoona, although after a long journey, he readily acceded to an offer to walk out to the banks of a neighbouring river frequented by the animal.—"We soon came to a tranquil part of the river," observes Mr. Bennett, "such as the colonists call a 'pond,' on the surface of which numerous aquatic plants grew. It is in places of this description that the *water-moles* are most commonly seen, seeking their food among the aquatic plants, whilst the steep and shaded banks afford them excellent situations for excavating their burrows. We remained stationary on the banks, waiting their appearance with some degree of impatience, and it was not long before my companion quietly directed my attention to one of these animals, paddling on the surface of the water, not far distant from the bank on which we were then standing. In such circumstances they may be readily recognized by their dark bodies just seen level with the surface, above which the head is slightly raised, and by the circles made in the water around them by their paddling action. On seeing them the spectator must remain perfectly stationary, as the slightest noise or movement of his body would cause their instant disappearance, so acute are they in sight or hearing, or perhaps both, and they seldom reappear when they have been frightened." On ordinary occasions, they do not remain more than a minute or two at a time on the surface of the water.

A burrow of an *Ornithorhynchus*, which Mr. Bennett opened, had its entrance on a steep part of a bank, situated

[1] Notes on the Natural History and Habits of the *Ornithorhynchus paradoxus*, by Mr. George Bennett.—Transactions of the Zoological Society, vol. i. p. 229.

about one foot from the water's edge, and concealed among the long grass and other plants. "This burrow ran up the bank in a serpentine course, approaching nearer to the surface of the earth towards its termination, at which part the nest is situated * * *. No nest had yet been made in the termination of the burrow, for that appears to be formed about the time of bringing forth the young, and consists merely of dried grass, weeds, &c. strewed over the floor of this part of the habitation." The expanded termination measured one foot in length and six inches in breadth, and the whole length of the burrow was twenty feet. Besides the entrance before alluded to, it appears there is usually a second opening into the burrows below the surface of the water, communicating with the interior just within the upper aperture. A burrow subsequently examined by Mr. Bennett terminated at a distance of thirty-five feet from the entrance; and that gentleman assures us that they have been found fifty feet in length.

From the burrow first opened by Mr. Bennett, a living female was taken, and placed in a cask, with grass, mud, water, &c., and in this situation it soon became tranquil, and apparently reconciled to its confinement. On his return home to Sydney, Mr. Bennett determined to indulge it with a bathe; and with this view, when he arrived in the vicinity of some ponds, he tied a long cord to its leg. "When placed on the bank it soon found its way into the water, and travelled up the stream apparently delighting in those places which most abounded in aquatic weeds. When diving in deep and clear water, its motions were distinctly seen: it sank speedily to the bottom, swam there for a short distance, and then rose again to the surface. It appeared, however, to prefer keeping close to the bank, occasionally thrusting its beak into the mud, from whence it evidently procured food, as, on raising the head after withdrawing the beak, the mandibles

were seen in lateral motion, as is usual when the animal masticates. The motions of the mandibles were similar to those of a duck under the same circumstances. After feeding it would lie sometimes on the grassy bank, and at others partly in and partly out of the water, combing and cleaning its coat with the claws of the hind feet. This process occupied a considerable time, and greatly improved its sleek and glossy appearance."

The Water-moles are said to have a peculiarly fishy smell, more especially when wet, which probably proceeds from an oily secretion: they are used by the Aborigines for food; "but it is no particular recommendation of them," Mr. Bennett remarks, "to say they are eaten by the native Australian, as nothing in the shape of provender comes amiss to him, whether it be snakes, rats, frogs, grubs, or the more delicate opossum, Bandicoot and Flying Squirrel."

The Ornithorhynchus is captured by the natives when in its burrow: they first examine the interior of the burrow, to ascertain, by the presence of recent footmarks on the soil, whether it is inhabited; and if the examination proves satisfactory, they proceed to dig holes with pieces of sticks, from the surface of the ground into the burrow, at distances from each other, until they discover its termination, when the Australians consider themselves exceedingly fortunate should they find the young, since they are regarded as a great delicacy.

The young have been found in their nests, by Mr. Bennett, of about 1¾ in. in length, in the early part of December; and near the end of the same month he found young Water-moles of ten inches in length: these latter were kept alive for nearly five weeks, and their habits, whilst in captivity, are described in detail in his paper, which is illustrated by some admirable figures shewing their various attitudes, &c. The young were allowed to run about the room, but an old Ornithorhynchus,

in the possession of our author, was so restless, and damaged the walls of the room so much, by her attempts at burrowing, that it was found necessary to confine her to the box. "During the day she would remain quiet, huddled up with her young ones; but at night she became very restless, and eager to escape. The little ones were as frolicsome as puppies, and apparently as fond of play; and many of their actions were not a little ludicrous. During the day they seemed to prefer a dark corner for repose, and generally resorted to the spot to which they had been accustomed, although they would change it on a sudden, apparently from mere caprice. They did not appear to like deep water, but enjoyed exceedingly a bathe in shallow water, with a turf of grass placed in one corner of the pan: they seldom remained longer than ten or fifteen minutes in the water at one time. Though apparently nocturnal, or at least preferring the cool and dusky evening to the glare and heat of noon, their movements in this respect were so irregular as to furnish no grounds for a definite conclusion. They slept much, and it frequently happened that one slept while the other was running about, and this occurred at almost all periods of the day. They climbed with great readiness to the summit of a bookcase, placing their backs against the wall and their feet against the bookcase; and thus, by means of their strong cutaneous muscles and of their claws, mounting with much expedition to the top. Their food consisted of bread soaked in water, chopped egg, and meat minced very small, and they did not seem to prefer milk to water."

The young are naked at first, and differ much from the adult in the form of the beak: this is very short in proportion, and has the margins smooth and fleshy; the tongue is proportionately large, reaching the extremity of the mouth, which is thus fitted for sucking. There is, moreover, according to Prof. Owen, a thin fold of integument surrounding the

base of the mandibles, which extends the angle of the mouth from the base of the lower jaw to equal the breadth of the base of the upper one, which must increase the facility for receiving the milk ejected from the mammary areola of the mother.

There is very little difference in the size of the male and female *Ornithorhynchus;* but the males, it would appear, are rather the larger. The average length, in fifteen specimens, Mr. Bennett found to be 1 foot 7 inches to 1 foot 8 inches in the males, and 1 foot 6 to 1 foot 7 inches in the females. One male specimen, shot near the Murrumbidgee River, measured 1 foot $11\frac{1}{4}$ inches. The following dimensions, taken from a recent specimen, will give an idea of the proportions of the parts:—

	Inches.
Length from the extremity of the mandible to the extremity of the tail	1 ft. $7\frac{7}{8}$
Length of upper mandible	$2\frac{7}{8}$
Breadth of ditto	$2\frac{1}{8}$
Length of lower mandible	$1\frac{6}{8}$
Breadth	$1\frac{3}{8}$
Length of fore leg	$3\frac{6}{8}$
Breadth of fore foot expanded	$4\frac{2}{8}$
Length of tail	$4\frac{5}{8}$
Breadth of ditto at the broadest part	$3\frac{2}{8}$
Hind leg to extremity of longest claw	4
Breadth of hind foot	$2\frac{4}{8}$

The other species of Ornithorhynchus enumerated in Zoological works, it appears to me, are founded upon individuals differing in age only. In the large and mature specimens, the fur is crisp, and of a dull brown colour; whilst in the smaller specimens it is of a bright brown hue, and soft to the touch, and, on the under parts of the body, is almost white. Those of smaller size and brighter colouring have received the specific names, *rufus*, *lævis*, and *brevirostris;* and I may further observe, that the specimen from which Dr. Shaw drew up his original account, and which is now in the

British Museum collection, presents a similar condition of the fur, and is of small size. The *O. fuscus* of Péron and Lesueur, and the *O. crispus* of Macgillivray, are large specimens, in which the fur is comparatively crisp, and of dull colouring. Mr. Macgillivray, it will be found[1], was himself subsequently of opinion, that his two species, *O. crispus* and *O. lævis*, were mere varieties of the *O. paradoxus*.

The head, feet, chest, bones, pelvis, &c. of the Ornithorhynchus are figured in Plate 2.

FIG. 1. The head viewed from above; half the natural size.
" 2. The same viewed from beneath.
(The remaining figures are of the natural size.)
" 3. The hind foot, viewed from beneath: *a*, the inner toe; *b*, the spur.
" 4. The fore foot, viewed from above: *a*, *a*, *a*, *a*, semi-cartilaginous appendages[2], springing from the under side of the apical portion of the toes, to support the membrane which fills up their interspaces.
" 5. The chest and shoulder bones: *a*, *a*, the blade bones (*scapulæ*); *b*, *b*, the coracoids; *c*, *c*, the epicoracoids; *d*, *d*, the clavicles; *e*, the episternum; *e**, *e**, lateral branches of the episternum; *f*, the foremost of the bones of the sternum, called the manubrium sterni; this is followed by three other sternal bones, *g*, which are small and narrow; *h*, the humerus.
" 6. The pelvis, shewing the position of the marsupial bones, *a*, *a*.

[1] See Memoirs of the Wernerian Society, vol. vi. p. 132.

[2] These appendages appear to be an extraordinary development of the fleshy pads which are observable on the under side of the apical portion of the toes in very many quadrupeds.

Genus, *Echidna*.

Echidna[1]. CUVIER, Tableau Élémentaire. 1797.
Tachyglossus[2]. ILLIGER, Prod. Syst. Mammalium et Avium, p. 14. 1811.

Rostrum naked, elongate, slender, and attenuated; mouth opening, small; tongue protractile, slender, cylindrical, and very long; palate, with horny papillæ. Body above, furnished with spines and hair intermixed: legs short and powerful; fore and hind feet, each with five well-developed toes, having large nails; the fore feet fitted for burrowing; the hind feet, in the male sex, furnished with a horny spur: tail very short: cœcum short. Habitat, Australia.

Two species only of the present genus are enumerated in systematic works, and one of these will perhaps prove to be a local variety: they are insect-feeding animals, and burrow in the ground. At a cursory glance they would somewhat resemble the Hedgehog, were it not for their long and slender snout.

[1] Ἔχιδνα, a viper. It is supposed the Echidna has the power of inflicting a poisoned wound with its spur; and this idea, it is probable, suggested the generic name given by Cuvier. It must be remarked, however, that there is no well-authenticated instance on record of such a wound having been inflicted by the animal.

[2] Ταχυς, quick; and γλωσσα, tongue.

ECHIDNA ACULEATA. The long-spined Echidna.

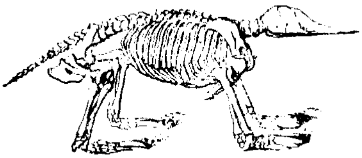
Myrmecophaga aculeata.	Porcupine Ant-eater, SHAW, Naturalists' Miscellany, vol. iii. pl. 109. 1792.
Aculeated Ant-eater.	SHAW, General Zoology, vol. i. pt. i. p. 175.
Ornithorhynchus Hystrix.	HOME, Philosoph. Transactions for 1802, p. 348.
Echidna Hystrix.	CUVIER, Règne Anim.
Tachyglossus aculeatus.	(ILLIGER), SCHREBER, Saugth. t. lxiii. B.
Echidna longiaculeata.	TIEDEMANN, Zoologie, i. 592.

About one foot in length: body stout, having the upper parts covered with strong spines, and the under parts, as well as the head and legs, clothed with brownish-black coarse hair; head with the facial portion produced into a slender and tapering snout, and covered with a naked skin; mouth opening small; tongue very long and flexible; legs short and strong, each foot furnished with five toes; those on the fore feet armed with large and strong claws; the inner toe of the

hind foot provided with a broad and rounded nail, the other toes having long and curved claws; the claw of the second toe very long. Tail very small, and hidden by the spines and fur.

The long-spined Echidna has long been known as a native of New South Wales, and the author is indebted to Mr. Gould for calling his attention to the fact of its also inhabiting the West Coast, that gentleman having recently received a specimen from the Swan River district.

The Echidna is a small animal, being about equal to the common Hedge-hog in size, but it has a powerful frame, fitted for burrowing habits.



Skeleton of the Echidna.

Its food consists of ants, and probably other small insects, and these are captured in the same way as the Ant-eaters (*Myrmecophaga*) procure similar prey—by the tongue, which in both instances is protractile, very long[1], slender and flexible, and is constantly kept lubricated with a viscous matter, to which the ants adhere. To supply this secretion, the Echidna is provided with two enormous submaxillary glands, which extend from behind the ear to the fore part of the chest. There are no teeth to the jaws, but the palatal portion of the mouth is armed with several rows of strong

[1] In the figure given by Sir Everard Home, in the Philosophical Transactions (1802), the tongue is represented as upwards of six inches in length.

horny spines, the points of which are directed backwards, and on the upper surface of the tongue are numerous small horny warts, between which and the palatal spines the prey of the animal is, no doubt, crushed, before passing into the stomach.

Side view of the Skull of the Echidna.

The skull might be compared to half a pear, cut lengthwise; the elongated facial bones, which are covered with a naked, blackish skin, representing the narrow end of the pear[1]. The muzzle is of a somewhat depressed form, and in an adult animal rather more than an inch and a half in length; its width at the base is three quarters of an inch, and near the tip, 4½ lines. The opening of the mouth is small, the angle being not more than four or five lines distant from the tip of the muzzle: the nostrils are situated on the upper surface, near the tip; the eyes are rather small, and of a black colour. The cavity of the ear is in the form of a long tube, and has its opening, which is large, and formed like an S, on the back part of the head;—it is compared, by Messrs. Quoy and Gaimard, to the larynx of a bird, being supported by cartilaginous hoops, in the same manner: there is no external auricle. The body is rather short and stout, and covered

[1] The following are the dimensions of the skull of an adult Echidna:—

	Inches.	Lines.
Total length	4	1
Greatest width (which is behind)	1	9¾
Width between orbits	0	7½
Length in front of orbit	1	11
Width immediately in front of orbit ...	0	10½
Width at the point of the muzzle	0	3
Length of zygomatic arch	0	11

with a thick skin, particularly on the back, where it has to support the strong spines: these are of a dirty-white colour, but more or less broadly tipped with black, sharply pointed, and average at about $1\frac{3}{4}$ inches in length; they commence on the back part of the head, and extend over the whole upper surface of the body. The points of these spines are directed backwards, and on the back, inwards, so that they cross each other in the mesial line: near the root of the tail they form a large tuft, radiating from two approximate centres, and hide the small rudimentary tail. The head (with the exception of the hinder part of the upper surface), and the lower half of the sides of the body, as well as the whole of the under parts and limbs, are covered with coarse brownish black hairs. The legs are short, and very strong; the fore feet are short and broad, and armed with large, solid, and nearly straight nails—that of the middle toe being usually about an inch in length, and a quarter of an inch in width; the shortest, which is found on the inner toe, is four or five lines in length: they are all rounded at the extremity. The hind feet are narrower, and less powerful, than the others, and have the inner toe very short, and apparently slightly opposeable; it is furnished with a broad and short nail, which is rounded at the extremity: the toe next the inner one is the longest, and is armed with an enormous claw, measuring sometimes an inch and a half in length; it is curved and nearly cylindrical, but concave beneath; the claws of the other toes are progressively shorter. The hind foot, when in its natural position, rests on its inner side, and perhaps in a great measure upon the thumb or great toe: by this arrangement the long claws are protected from wear when the animal is walking, and they have the concave surface presented outwards. The use of these claws, it would appear, is to cast away the earth which is loosened by the stronger fore feet and claws. Like the Ornithorhynchus, the present animal has the heel armed with a strong spur in the male sex;

and this spur is moveable, perforated, and supplied with a gland, and muscles capable of ejecting the secretion of the gland through the canal of the spur, as in the animal just mentioned. Messrs. Quoy and Gaimard tried, by irritating the animal, to induce it to inflict a wound upon themselves, that they might clear up the disputed point as to whether this apparatus was poisonous, but were as unsuccessful as Mr. Bennett, when he tried a similar experiment with the Ornithorhynchus; and they state that, after repeated inquiries, they could not learn that any accident had ever happened from a wound of the spur.

The French naturalists just mentioned procured a specimen of an Echidna (the *E. setosa*) at Van Diemen's Land, which they kept alive for some time. They describe it as an apathetic and stupid animal; and state, that for the first month after its capture it took no sustenance whatever, but at the end of that time it began to lap, and finally to eat some food prepared for it, consisting of a mixture of flour, water, and sugar. It avoided the light, and remained during the day partially rolled up, having its head bent forwards between its fore legs. The rapidity with which it burrowed was astonishing; being placed in a large case full of earth, containing plants, it worked its way to the bottom in less than two minutes. The naked snout, although highly sensitive, assists the feet in the labour.

Messrs. Bass and Flinders, when at Twofold Bay, state that their dogs found a Porcupine Ant-eater, but that the dogs could make no impression on the animal, which escaped by burrowing in the loose sand, not head foremost, but by sinking itself directly downwards, and thus presenting nothing but his prickly back to his adversaries.

Lieutenant Breton succeeded in keeping one of these animals alive for some time, feeding it at first upon ants' eggs and milk; but afterwards, when on shipboard, its food con-

sisted of egg, liver, and meat, chopped very fine. It drank much water. Its mode of eating, Lieut. Breton observes, was very curious, the tongue being used sometimes in the same manner as that of the Chameleon, and sometimes it reminded one of the mode in which a mower uses his scythe, the tongue being curved laterally, and the food, as it were, swept into the mouth. The specimen died suddenly off Cape Horn, but the gentleman just mentioned expressed his opinion that the Echidna might be brought alive to England; and in the Proceedings of the Zoological Society for 1834, p. 23, will be found some hints on the mode of treatment of the animal in captivity.

In the spring of the present year a specimen of the Echidna arrived alive in England, and lived for a short time in the Zoological Society's menagerie. This specimen the author had not an opportunity of examining, but he has been kindly furnished with some notes[1] made by Professor Owen, who visited the Society's Gardens soon after its arrival, with a view to observe its habits. From these notes are the following extracts:—The animal was apparently in sound health, and active; it was placed in a large shallow box, having a wire-work top, and at the bottom a quantity of sand was deposited. In this sand it endeavoured to seek its natural shelter by burrowing; but finding it was too shallow, the Echidna commenced exploring its cage, thrusting its long slender nose into every fissure, and through the bars, to find some outlet through which it might effect its escape; and it was not until it had learnt that this was impossible, that it noticed its food, which consisted of bread and milk, in which some meal-worms were placed. Although it frequently had its nose in contact with the meal-worms it did not eat them. The milk was

[1] These notes were communicated to the Zoological Society in the month of July.

licked up by a rapid protrusion and retraction of the long cylindrical tongue. When seized, it offered but little resistance, and made no demonstration of defending itself by striking with its spur; its only action when irritated was to roll itself up into a ball, in which position the sharp points of the spines presented themselves in all directions. When asleep it likewise rolled itself up. Its temperature was 85° Fahr., being nearly 10° lower than that of a rabbit. The blood-discs, like those of the *Ornithorhynchus*, were flat and circular, and in fact resembled those of other mammalia in form, proportions, and colour: they were found to be rather larger than in the human species and the Apes.

ECHIDNA SETOSA. Short-spined Echidna.

Echidna setosa.	Cuvier, Règne Animal (1st edit. 1817), vol. i. p. 226; Nouvelle édit. i. p. 235.
Echidna breviaculeata.	Tiedemann, Zoologie, i. p. 592.

Fur harsh, long, and almost hiding the spines; head without spines; general colour, brown; head, and under parts of body, pale brown; eye encircled with dark brown. Total length, from 14 to 17 inches.

Inhabits Van Diemen's Land.

In the *Echidna hystrix* the spines are long, and the fur short and scanty, and on the back of the animal the hair is not visible, whilst in the *Echidna setosa* the fur is so long as in a great measure to hide the spines.

The largest specimen of *E. setosa,* which has come under my notice, is contained in the Museum of the Zoological Society, having been presented by Lieut. Breton. This specimen, like all others having the short spines, is from Van Diemen's Land, and measures 17½ inches in total length;

its spur is small, being less than a quarter of an inch in length. In the same collection is a smaller specimen than the above, in which the spines and the spur are more developed.

The British Museum collection contains both sexes, and several specimens of each of the supposed species of *Echidna;* and there is, moreover, a half-grown specimen of the *E. hystrix.* The *E. setosa* is subject to some slight variation in tint, as well as in the texture of the fur: the spines also vary slightly, being somewhat longer in some specimens than in others; yet the differences observable in individuals are not such as to render it difficult to distinguish the *E. setosa* from the *E. hystrix;* nor can the differences existing between these two animals be those of age or sex, as some have supposed. The *E. hystrix* is confined to the continent of Australia, whilst the present animal is peculiar to Van Diemen's Land. M. Desmarest states, that the claws in the *E. setosa* are narrower than in *E. hystrix,* but I have not found any constant difference in this respect; indeed, I have not been able to discover any other differences, excepting those observable in the fur and spines; and this leads me to doubt there being two species, and to suspect that the comparatively humid climate of Van Diemen's Land may have had the effect of causing the fur to become longer and more dense; and if so, the increased development of the fur would, in all probability, affect the growth of the spines, by robbing them of their nutriment. The present species, or variety, was first described and figured by Sir Everard Home, in the Philosophical Transactions for 1802, p. 357, Pl. 13.

Since the above was in type, the author has had an opportunity of examining some specimens of the Short-spined Echidna preserved in spirits, and which are contained in the collection of the British Museum; one of these, a full-grown female, furnished the following dimensions:—

	In.	Lines.
Total length	15	0
Width of body, about	7	6
Length of the naked snout	1	$6\frac{1}{2}$
Width of ditto at the base	0	8
" near the apex	0	$3\frac{2}{3}$
Distance from the angle of the mouth to the apex of snout	0	$4\frac{2}{3}$
Length of the fore foot, including the nails ...	1	6
Width of ditto	1	9
Length of the nail of the middle finger	1	0
Width of ditto	0	$4\frac{1}{2}$
Length of hind foot, not including the nails ...	1	4
Width of ditto	1	$3\frac{1}{2}$
Length of longest nail (that on the innermost toe but one)	1	9
Length of nail of little tce	0	6
From the eye to the tip of the muzzle	2	1

The nostrils are situated on the upper surface of the muzzle, very near the tip, being about $\frac{1}{12}$ of an inch distant from that point, and are in the form of narrow openings of $\frac{2}{12}$ of an inch in length; they nearly meet posteriorly, and diverge slightly in front, being here separated by about $\frac{1}{8}$ of an inch, or rather more. The tongue, which is very slender, pointed, and nearly cylindrical (but slightly depressed), was protruded, and could be with ease drawn out of the mouth to the distance of more than three inches.

The head and feet of a female specimen of the *Echidna setosa* are represented, of the natural size, in Plate 2.

FIG. 7. The fore part of the head viewed from the side.
" 8. The fore foot viewed from above: *a*, the thumb or inner toe.
" 9. The hind foot viewed from beneath: *a*, the inner toe.

MACROPODIDÆ; or Kangaroo Family.

Dentition.—Incisors, $\frac{6}{2}$; canines, $\frac{0}{0}$, or $\frac{1-1}{0-0}$; premolars, $\frac{1-1}{1-1}$; molars, $\frac{4-4}{4-4}$ = 28 or 30[1].

Head elongated, the muzzle contracted; upper lip cleft; muffle[2] clothed with small hairs, or naked. Distinct eye-lashes springing from the eye-lid, as in man, in nearly all the species.

Clavicles slender and weak, especially in the large species of Macropus proper.

Fore limbs smaller than the hind—usually very small in proportion; the hands naked beneath, and having five well-developed fingers; each finger armed with a strong curved claw.

Hind legs large and powerful: the foot long; toes four in number, the inner, or first toe, being absent; the second and third toes long, but extremely slender, and united in one common integument, so as to have the appearance of a single slender toe with a double nail; the nails are distinct, oblong, and hollow

[1] The above is the usual and most simple method of expressing the number of teeth of different kinds: by incisors $\frac{6}{2}$, is meant there are six in the upper jaw, and two in the lower, and that they form a continuous series, or touch each other in either jaw; were they separated by a distinct interspace in the upper, and also in the lower jaw (as it sometimes happens), this would have been expressed thus, $\frac{3-3}{1-1}$, like the molar teeth, $\frac{4-4}{4-4}$; *i. e.* four on each side of each jaw. When we speak of "the three molars," or "the three premolars," it must be understood we mean the three molars, or the three premolars, on *either side* of the upper or under jaw, as the case may be; in all cases such expressions (where not otherwise mentioned) will refer to *one* series: that is, upon the supposition that we view the *whole* of the teeth of an animal as forming *four* series—a series on the right side of the upper jaw and another on the left, and the same in the lower.

[2] The French naturalists use the word "muffle" for that part at the end of the nose which is naked in the Ox, Dog, &c.; where the same part is covered by hairs, as in the Rabbit, the animal is said to have no muffle. The term will be used to designate the corresponding part of the nose, whether hairy or not, in this work; for there are intermediate conditions, and it will be convenient to have some definite term for the part in question.

beneath; the fourth toe much developed, and armed with a large solid claw, compressed above, broad and flat beneath, and more or less pointed; the fifth, or outer toe, well developed, but shorter and smaller than the enormous fourth toe, like which it is armed with a strong solid claw: fibula slender, and with its lower half closely applied to the tibia, though easily separable, excepting in *Hypsiprymnus*, where the lower portion is firmly joined to the tibia.

Tail long, and usually very powerful.

Pouch well developed, and opening forwards.

Mammæ four[1].

Stomach complex; cæcum long and simple.

THE incisor teeth of the upper jaw present a broad outer and inner surface, and are compressed from front to back: and so far resemble the incisors in man. The two foremost, though rather widely separated at the base, converge and meet at their apices: they are considerably arched in front in the longitudinal direction, and have the outer surface slightly convex in the transverse direction, and often presenting a shallow longitudinal depression. The second incisor is usually narrower than the first, dilated at the extremity, which is truncated, nearly flat externally, or slightly convex, and sometimes presents a vertical groove at this part; the third incisor is most frequently broader than either of the preceding pair, and has one or two external vertical folds; its apical portion is partly overlapped in front by the second incisor; the apices of these teeth are on the same plane, or nearly so, but the cutting edge of the foremost, on each side, descends obliquely from the outer to the inner side. The lower incisors are horizontal, long, compressed, and lanceolate, and have cutting external and internal margins; their outer surface is convex, and the inner surface is strongly convex in the transverse direction, in the middle, but concave near the margins; when

[1] I am not sure that this number of mammæ is constant.

the mouth is closed, the outer cutting edge of the lower incisors is brought in contact with the cutting edges of the two posterior incisors of the upper jaw on either side, and their points shut within the apex of the foremost pair of the upper jaw. In *Macropus major* (and perhaps in some nearly allied species) the rami of the lower jaw are loosely attached at the chin, and at the apex they are free, and the animal has the power of slightly separating the lower incisors, so that their outer cutting edges are brought more closely in contact with the upper incisors than they otherwise would be. The foremost of the molar series is a false molar, and differs in its form from the others, being laterally compressed; it sometimes has an indented fold of enamel both on the outer and inner side, in or near the middle of the tooth, the crown of which is thus divided into two parts, which are equal in length, but the posterior half has a greater transverse diameter. The true molars differ somewhat in size, there being a slight and gradual increase in size from the foremost to the last: the crown of each molar presents nearly a quadrate figure, but is longer than broad; it has two principal transverse ridges, which, before worn, are considerably elevated, and have trenchant edges; the foremost of these ridges is evidently formed by the junction of the anterior pair, and the hindermost by the union of the posterior pair of cusps, which are most commonly seen in complicated molar teeth, and which we find much less perfectly joined in the Kangaroo-rats. Besides these two principal eminences, are two other transverse ridges, which are smaller and less elevated; one is situated on the fore part of the tooth, and the other, which is less distinct, on the hinder part, but this latter is wanting in the molars of the lower jaw: these smaller ridges appear to represent what I have termed the band of the tooth, which in these animals is only developed in the parts mentioned. Besides the transverse ridges, is a longitudinal ridge, very nearly in the mesial line of the tooth, but

which is interrupted in parts, merely serving to connect each pair of transverse cusps. All these ridges are covered externally with enamel, and when the molar is considerably worn we find it presenting two principal loops, or folds, of enamel, entering from opposite sides of the tooth, and meeting in the mesial line; two much narrower folds enter into the body of the tooth, in the same way, in the fore part of the tooth, but at the back of the tooth there is but one distinct narrow fold, and that enters from the outer side, and exists only in the upper molars.

The Kangaroos are vegetable-feeding animals, browsing upon herbage, like the Ruminants, and it appears that in some cases they chew the cud, like those animals[1]. Some are of great size, being nearly as tall as a man when in their common erect position; others are as small as the common hare, and indeed greatly resemble that animal in general appearance. They are remarkable, generally, for the small size of the anterior extremities, and for the slender proportions of the fore parts of the body, which are very flexible, and, on the other hand, for the great bulk of the hinder part of the body, and the large size of the hind legs and tail. When browsing they apply the fore feet to the ground, but usually they rest entirely on the hind feet and tail, and have the fore part of the body elevated, and inclining slightly forwards. The great and powerful tail serves as an extra limb, and is capable for a moment of supporting the whole weight of the body. In some of the smaller species of the present family the disproportion in size of the fore and hind legs is much less striking, and the tail is less powerful than in the large species of true Macropus, as now restricted; and in the

[1] "I have more than once observed the act of rumination in the Kangaroos kept in the Vivarium of the Zoological Society."—OWEN, article *Marsupialia*, in Todd's Cyclopædia of Anatomy and Physiology.

Tree Kangaroos of New Guinea we find the fore legs almost as long and powerful as the hind: the tail, which is clothed for the most part with short adpressed hairs in the ordinary Kangaroos, here is very bushy, as well as in the rock-inhabiting Kangaroos: these, and other modifications, however, observed in the various species, are pointed out in their proper places.

About the beginning of the present century but three species of the present group were known,—the *Macropus giganteus*, and *Macropus minor*, of Shaw, and the *Didelphys Brunii* of older authors. Illiger was the first to subdivide the genus *Macropus* of Shaw, instituting a new genus upon the smaller species of that author, to which he gave the name *Hypsiprymnus;* he at the same time unnecessarily substituted the new name *Halmaturus* for that of *Macropus*. In the *Dictionnaire des Sciences Naturelles*, article Kangaroo, M. F. Cuvier further subdivided the group, which had been augmented by several new species brought home by the French scientific expeditions, separating from the *Macropus giganteus*, and some nearly-allied species, certain Kangaroos, which differed in having the muffle naked. For his new section he retained Illiger's name, *Halmaturus*. The Kangaroo group is now very numerous in species, is regarded as forming a family, and has been subdivided into many genera. In some cases the authors of the new genera have not taken the trouble to define them, and in some the characters given are merely individual peculiarities.

As regards the section *Macropus proper* (as now restricted), characterised as having the muffle hairy, it is necessary to state, that the species which are arranged in that section differ as to the extent of the part of the muffle which is clothed with hairs; and in some cases, as in *M. rufus*, the muffle is quite as imperfectly clothed as in certain Halmaturi, in which the muffle is said to be naked. In the *Macropus leporoides*, the muffle is entirely covered with velvet-like hair;

this little animal forms the type of Mr. Gould's genus *Lagorchestes;* but even in this little section I find the muffle less perfectly clothed in a second and nearly allied species. Lastly, among the Kangaroo-rats, in which the muffle is described as "bald," is one species (*Bettongia rufescens*) in which that part is almost entirely covered with small hairs.

The presence or absence of canine teeth is dwelt upon as furnishing a distinguishing character of the Kangaroos and Kangaroo-rats; several species of Kangaroos, however, have canine teeth even when adult, and in all probability all possess them in a very rudimentary condition when young: they have been noticed by Professor Owen in the young *Macropus giganteus*. In two adult skulls of different species of *Halmaturus* in the British Museum (*H. Ualabatus* and *H. Thetidis*), I find the sockets of these teeth remaining. The canines, however, cannot be regarded as functional teeth in the Kangaroos, where they are always very small, whilst in the *Hypsiprymni* (or Kangaroo-rats) they are tolerably well developed.

In the structure of the incisor teeth of the upper jaw, the various species of *Macropodidæ* differ considerably; the *principal* modifications which I have noticed have presented themselves in the *Macropus giganteus*, *M. Bennettii*, *M. Thetidis*, *M. leporoides*, and in the genus *Hypsiprymnus*, and are pointed out in their proper places.

With regard to the premolars, and true molars, there are but two striking modifications of structure, and these are exhibited, on the one hand, in the Kangaroos proper, and, on the other, in the Kangaroo-rats; in these animals there are equally marked modifications in the structure of the cranium, and some less striking peculiarities in the extremities. I may add, that in the true Kangaroos, which are, I believe, the only Marsupials which are not of nocturnal habits, there are always distinct eyelashes to the eyes, springing from the eye-

lids, as in the human subject: in no other Marsupials have I noticed true eyelashes: indeed, I believe the Macropi with eyelashes are the only Marsupials which roam about during the day, and this may account for the presence of these appendages.

Upon the whole, it appears to me, that the most important divisions which have been made of the group *Macropodidæ* are those which have received the names *Hypsiprymnus* and *Dendrolagus*. The third division, containing the great bulk of the species, can be subdivided into groups of minor value only; the minor divisions, however, will be convenient, though to a certain extent arbitrary, as may be inferred from the preceding observations.

It will be most convenient to notice here the

FOSSIL MACROPODIDÆ.

These are confined to Australia. The most important and earliest notice we have of the existence of fossil Kangaroos is that drawn up by Professor Owen upon a collection formed by Major (now Sir T. L.) Mitchell, and which is published in that gentleman's work entitled *Three Expeditions into the Interior of Eastern Australia*. The remains in question were found by Sir T. L. Mitchell, together with numerous others, appertaining entirely to Marsupial animals, in some caverns in the limestone rocks of Wellington Valley[1]. They were embedded in a fine red earth, more or less cemented together by stalagmite, and both bones and matrices closely resembled in their conditions those of the English caverns (of Torquay, for example) and of the caves in the

[1] An account of these caverns will be found in the second volume of the work quoted, and, from the pen of the same author, in the Proceedings of the Geological Society for April 1831.

interior islands of Brazil. Other Marsupial remains, including species of the present group, and also including some of the most distinct of the cavern species, have since been found by Sir T. L. Mitchell in the alluvial, or newer tertiary deposits, in the bed of the Condamine River, west of Moreton Bay; and we are indebted to Count Strzelecki for further discoveries of mammalian remains in the Wellington Valley caverns. Amongst the specimens contained in these collections, which have been presented partly to the Geological Society, and partly to the Museum of the Royal College of Surgeons[1], are remains appertaining to about six or seven distinct species of *Macropodidæ*: some approximate in size to the *Macropus major*, and with respect to these, as well as others of small size, Professor Owen remarks, that from want of skeletons of existing species of Kangaroos, he must leave doubtful the specific determination. The following three species are of very large size, and clearly differ from any of the hitherto-discovered large species.

Macropus Atlas (fossil): Owen, in Mitchell's Journal, &c. Vol. II. (2d Ed.) p. 365, Pl. 47, fig. 1; and in Owen's Odontography, Pl. 101, figs. 3 and 5.

This species, Professor Owen observes, must have been at least one-third larger than the *Macropus major*: it is chiefly remarkable for the great size of the permanent spurious molar, in which respect it approaches the *Hypsiprymni*; and, inasmuch as this tooth wants the external vertical grooves, and the molar teeth have much elevated and sharp transverse ridges, the *M. Atlas* approximates most nearly to the

[1] The first of Sir T. L. Mitchell's collections was presented by that gentleman to the Geological Society; the other collection, as well as the collection formed by the enterprising traveller, Count Strzelecki, are presented to the College of Surgeons.

Hypsiprymnus Brunii. The molar teeth are proportionately shorter and broader than in *M. major*, and differ in having the longitudinal ridge in the central transverse valley almost obliterated; but, commencing at the bottom and middle of this valley, is a distinct sharp ridge, which runs upwards and inwards, and terminates at the inner salient angle of the anterior principal cusp.

	Lines.
Length of the second upper true molar teeth	$6\frac{1}{2}$
Width of ditto	$5\frac{5}{8}$
Length of the permanent spurious molar	$8\frac{1}{8}$

Several fragments of the cranium and lower jaw of the *M. Atlas* have been found both in the caves at Wellington Valley, and in the alluvial or newer tertiary deposits in the Condamine River, West of Moreton Bay. In the Museum of the College of Surgeons is a shaft of a right humerus (having a circumference of three inches below the deltoid ridge), a distal end of a femur, and a second phalanx of the longest toe of the hind foot, which Professor Owen thinks in all probability belong to the present species; they were contained in the same collections as the parts of the cranium referred to.

Macropus Titan (fossil): OWEN, in Mitchell's Journal, Vol. II. p. 365, Pl. 47, fig. 3; Odontography, Pl. 101, figs. 1 and 2.

Founded upon portions of the upper and lower jaw, containing molar teeth: these indicate an animal of equal size to the preceding, but which is readily distinguished from it by the comparatively small size of the first or spurious molar; in this respect more nearly corresponding with the *M. major*.

A fragment of the right side of the upper jaw, contained in the Museum of the College of Surgeons, possesses all the five

molar teeth; the foremost of these are fractured. The whole series is 2 inches $4\frac{2}{3}$ lines in length; the length of the hindermost molar is $7\frac{3}{4}$ lines, and its width is $5\frac{3}{4}$ lines. The longitudinal ridge in the middle valley of the tooth is well developed.

In the same museum is the distal half of a right humerus, a lower end of a left femur, and a corresponding part of the right femur, together with a small fragment of a shaft of a femur, which Professor Owen thinks probably belongs to the *M. Titan*. The above remains were found in the newer tertiary deposits in the bed of the Condamine River: the fragments upon which the author just mentioned founded the *M. Titan* were found in the caverns of Wellington Valley.

Macropus Goliah (fossil): OWEN'S MSS.

All that is known of this species is a fragment of the right side of the upper jaw, containing two molar teeth, which is from the newer tertiary deposits of the Darling Downs, Australia. Judging from the size of the teeth, this animal must have been even larger than either of the two preceding species, the two molars measuring together, in the longitudinal direction, one inch and a half, and the width of one of the molars being $7\frac{1}{2}$ lines; they are proportionately broader, therefore, than in *Macropus major*.

Besides these, Professor Owen characterises with a name a fourth fossil species—the

Macropus affinis (fossil) of the Descriptive Catalogue of the Fossil Organic Remains of Mammalia and Aves, contained in the Museum of the Royal College of Surgeons, p. 328.

It is founded upon a "portion of the left ramus of the lower jaw of a Kangaroo, with the penultimate and antepenul-

timate molars, showing the crowns much worn by mastication: the crown of the last molar has been broken off, and there are the remains of two molars anterior to the antepenultimate one; the extent of the four posterior molars is 1 inch 10 lines; the penultimate molar, besides its inferior size, differs from the corresponding tooth in *M. Atlas* in being narrower in proportion to its length, in having a relatively smaller talon, and no posterior one; it differs, *à fortiori*, from the antepenultimate molar of the *M. Titan*, inasmuch as this has a larger proportional anterior talon than in the *M. Atlas*. The teeth and the jaw of this specimen closely agree in size with those of the large male *Macropus laniger*, but the inner lobes of the penultimate molar are thicker in the fossil, and the jaw does not swell out so much on the outside of the alveolus of the last molar; there is also a longitudinal indentation on the outside of the alveolar process of the anterior molars. The present fossil, therefore, indicates either an extinct species of the size of the existing *M. laniger*, or it may have belonged to a female of a third gigantic extinct species." It is from the newer tertiary deposits in the bed of the Condamine River, west of Moreton Bay, Australia.

Amongst the specimens from the caverns of Wellington Valley, presented by Count Strzelecki to the College of Surgeons, the author noticed fragments containing molar teeth nearly corresponding in size to those of *M. Thetidis*, and others which must have belonged to Kangaroos as small as the *M. leporoides*.

There were also fragments which are clearly referrible to the genus *Hypsiprymnus*; upon these are founded the—

Hypsiprymnus spelæus, OWEN: Catalogue of the Fossil Organic Remains, &c., p. 332.

No. 1537 of the Catalogue mentioned is a fragment of the

right side of the upper jaw of the present species; it exhibits the characteristic premolar, and two of the true molar teeth; the three teeth together measure $9\frac{3}{4}$ lines, of which the premolar is $4\frac{3}{4}$ lines in length; it has about six vertical grooves on the outer side. In the breccia attached to this fragment is an incisor tooth of a Rodent, allied to the Rats.

Figs. 2, 3, 4, and 5, of Plate 3, will convey an idea of the general form of the skull, and of the relative position and form of the teeth, in the Kangaroo family.

FIG. 2. The skull viewed from beneath; *a a*, the posterior palatine openings; *i*, the incisor teeth; *p-m*, the premolar; *m*, the four molar teeth.

FIG. 2 *a*. The lower jaw viewed from the outer side; *i*, the incisor tooth: *p-m*, the premolar; *a*, the coronoid process; *b*, the condyle; *c*, the angle,—which is bent inwards.

FIG. 2 *b*. The left half of the lower jaw viewed from above.

FIG. 2 *c*. Shows the three incisors of the left side of the upper jaw.

FIG. 2 *d*. Represents the cutting surfaces of the same teeth.

FIG. 3. Molar tooth of the upper jaw, showing the grinding surface.

FIG. 4. Molar tooth of the lower jaw.

FIG. 5. An unworn molar tooth of the upper jaw, viewed from the inner side; *a*, the anterior principal transverse cusp; *b*, the posterior ditto; *c*, a small longitudinal ridge in the middle of the tooth; *d*, a portion of the *band*, which is prominent on the fore part of the tooth, wanting on the outer side, and slightly developed on the inner side, at *f*, and on the back of the molar, at *e*.—This tooth is magnified.

on these parts being mostly of them broadly tipped with whitish; upper surface of muzzle dusky-brown; around angle of mouth whitish; ears rather large, with long white hairs internally, and with dusky hairs on the outer surface: fore feet dusky-brown, the toes black; hind feet brown-white, the toes brown-black, and black at the extremity; tail black at the apex.

THE Great Kangaroo was discovered in 1770, during Cook's first voyage, whilst that celebrated navigator was stationed on the coast of New South Wales, to repair his vessel, which was in a very dangerous condition, having struck on a rock (and, indeed, was only saved by a portion of the rock, which broke off, and in a great measure filled the hole it had made). The Kangaroo was first seen by a party sent out to procure food for the sick. On the following day Cook himself and Sir Joseph (then Mr.) Banks had the pleasure of beholding this extraordinary animal, and soon afterwards a specimen was shot, from which, in all probability, the notes were made, and the figure drawn, which are published in Dr. Hawkesworth's Account of the Voyage (p. 561, fig. 20, and pp. 577-578). Skins of the animal, however, appear to have been brought home, from which some slight additional matter was added to the descriptions by Pennant, who gives the dimensions of the "largest skin" he examined; and it is probably from the same source that Dr. Shaw discovered the two, united, little inner toes, which had not previously been noticed.

The earliest technical name applied to the animal was that of *Yerbua gigantea*, given by Zimmerman[1], in 1777; and in the following year it received the name of *Didelphis gi[illegible]a*, [illegible] Schreber[2]. The accounts of both of these

[1] [illegible]phicæ Quadrupedum, p. 526.
[2] [illegible] iii. p. 552, Pl. 154 (copied from the Plate in Hawkes-

authors, as well as those of Pennant[1] (in the first edition of his History of Quadrupeds), and Gmelin[2], which followed, are founded on the materials collected in Cook's Voyage. Governor Phillip[3], and White[4], in their Voyages, add further matter towards completing the history of this animal; and we find a summary (including some original observations, made upon living specimens, subsequently brought over to this country), given by Pennant, in the third edition of his general work upon Quadrupeds, which, so far as the habits and external characters of the Great Kangaroo are concerned, leave but little to be desired. Nor were appropriate generic and specific names wanting; Dr. Shaw having, in the meantime, supplied the deficiency of a proper generic title in the part of his Naturalists' Miscellany published in 1790, (Plate 33). We find, however, a number of new names given to the Kangaroo many years afterwards. There is, indeed, such a variety of names and different combinations of generic and specific appellations, that we have thought it desirable not to burden these pages with more than a few, which appeared necessary as a key, more especially, to the works of the principal authors on Mammalogy.

The Great Kangaroo inhabits New South Wales, Southern and Western Australia, and Van Diemen's Land, and is known to the colonists by the names "Boomer" and "Forrester." In the older works it is said to be called Kangaroo by the natives; and Mr. Gould informs us, it is the "Bundaary" of the Aborigines of the Liverpool range. It prefers low grassy hills and plains, and open parts of the

[1] Vol. ii. p. 306, Pl. 35: (the figure, like that given by Schreber, is copied from the Plate in Cook's Voyage).

[2] Linn. Syst. Nat. ed. Gmel. vol. i. p. 109.

[3] The Voyage of Governor Phillip to Botany Bay, p. 104, Pl. 10.

[4] Journal of a Voyage to New South Wales; appendix by John Hunter, p. 272, and Plate,

country, where it browses upon the herbage and low bushes. During the heat of the day it shelters itself among the bushes, tall grass, or ferns. In its more common position it rests on the hind legs and terminal half of the tail, with the anterior part of the body bent forwards, and but little elevated, but upon the slightest alarm the body is raised perpendicularly, and the animal is thus enabled to command a distant view. The senses of smell and sight in the Kangaroos are very acute, and as they are timid animals, they are very difficult to approach; they nevertheless not unfrequently fall a prey to the native dog, and are much hunted by the natives (their flesh being well-flavoured), who procure them by means of their unerring spears. Sometimes, discovering their retreat, the natives form a large circle, and gradually close upon them, and by shouting and yelling, Mr. Gould informs us, so terrify the animals, that they become confused, and are readily dispatched by means of the bommerengs, clubs, and spears. "Still, however formidable an enemy the Aborigines may have been," says this author, "the Great Kangaroo finds, at the present time, a far greater one in the white man, whose superior knowledge enables him to employ for its destruction much more efficient weapons than those of the more simple son of nature. Independently of the gun, he brings to his aid dogs of superior breed, and of so savage a nature, that the timid Kangaroo has but little chance when opposed to them. These dogs, which run entirely by sight, partake of the nature of the greyhound and deerhound, and, from their great strength and fleetness, are so well adapted for the duties to which they are trained, that the escape of the Kangaroo, when it occurs, is owing to peculiar and favourable circumstances; as, for example, the oppressive heat of the day, or the nature of the ground; the former incapacitating the dogs for a severe chase, and the hard

ridges which the Kangaroo invariably endeavours to gain, giving him great advantage over his pursuers. On such grounds the females in particular will frequently outstrip the fleetest greyhound, while, on the contrary, heavy old males, on soft ground, are easily overtaken. Many of these fine Kangaroo-dogs are kept at the stock stations of the interior, for the sole purpose of running the Kangaroo and the Emu, the latter being killed solely for the supply of oil which it yields, and the former for mere sport, or for food for the dogs. Although I have killed the largest males with a single dog, it is not generally advisable to attempt this, as they possess great power, and frequently rip up the dogs, and sometimes even cut them to the heart with a single stroke of the hind leg. Three or four dogs are more generally laid on; one of superior fleetness to 'pull' the Kangaroo, while the others rush in upon and kill it. It sometimes adopts a singular mode of defending itself, by clasping its short, powerful fore-limbs around its antagonist, leaping away with it to the nearest water-hole, and there keeping it beneath the water until drowned: with dogs the old males will do this whenever they have an opportunity; and it is said, that they will also attempt to do the same with man. In Van Diemen's Land the *Macropus giganteus* also forms an object of chace, and, like the Deer and Fox of England, is hunted with hounds."

Like other animals whose forms differ considerably from those with which our eye is familiar, the Kangaroo, when first beheld, does not strike us as having agreeable proportions, and its movements appear awkward, especially when the animal is browsing, at which time it rests upon its four legs; requiring then to move but short distances, the body is outstretched, and the hinder parts, assisted by the tail, are suddenly brought close to the anterior extremities, and this

movement is repeated so long as the animal continues to graze; but when it wishes to reach a distant spot, the fore legs are removed from the ground, and it attains its end by a succession of bounds, and with an ease which at once removes the impression of awkwardness. When in an open country, flying from its enemies, the Great Kangaroo is said to make leaps to the distance of fifteen feet and more: its body outstretched nearly horizontally, and the great tail in the same direction, the latter is not then applied to the ground, but serves as a balance, and to steady the course. "The prehensile faculty and unguiculate structure of the anterior extremities (as Professor Owen observes), appear to have been indispensable to animals requiring to perform various manipulations in relation to the economy of the marsupial pouch; and when such an animal is destined, like the Ruminant, to range the wilderness in quest of pasturage, the requisite powers of the anterior members are retained, and secured to it by an enormous development of the hinder extremities, to which the function of locomotion is almost restricted."

Without large canine teeth or horns, as weapons of defence, the Kangaroo, as is seen from the foregoing pages, is yet by no means to be attacked with impunity; its powerful hind legs, furnished with strong pointed nails, are formidable weapons, and the tail is so muscular, that it is capable of sustaining the whole weight of the body during the moment that they are used in striking. The fore claws are strong, and likewise used as weapons of defence.

In various accounts of the habits of the Kangaroo, the animal is said to be gregarious, living in flocks, which are generally headed by an old male; but Mr. Gunn, a good observer, who has published some interesting notes on the habits of various species of marsupial animals[1], attributes

[1] See Annals and Magazine of Natural History, vol. i. p. 104.

their being occasionally seen in flocks to the circumstance of their food being abundant in particular spots—as on recently burnt land, &c. Mr. Gould is also of opinion, that the Great Kangaroo is not, strictly speaking, a gregarious animal.

The ears in the Great Kangaroo are moderately large ; the tail long and very thick, especially at the base ; the fur moderate both as to length and texture, and the hairs of which it is composed are somewhat waved, giving it a slight woolly texture. The general colour is grey-brown, darkish on the back, and rather pale on the sides of the body ; the under parts of the body, and inner sides of the limbs, are whitish ; the hairs of the fur, both on the upper and under parts of the body, are brown-grey at the root ; those on the back of the ear whitish-brown towards the point, and brown, or brown-black, at the point. The head is nearly of the same colour as the body ; but the muzzle is somewhat dusky, and the lower parts of the cheeks are greyish ; around the angle of the mouth the hairs are white, and there is sometimes an indistinct whitish mark running back on to the cheeks from that part ; the chin is dusky. The ears are well clothed with white hairs internally ; externally grey, but dusky towards the base. The prevailing hue of the fore-legs is whitish grey ; sometimes a dusky mark is observed on the elbow : the fore-feet are freckled, or finely pencilled, with black and white, and the toes are black. The hind legs and base of the tarsi are very pale, and may be described as brown-white ; the toes are brownish black, or black. The tail is clothed at the base with fur like that of the body, but passing onwards towards the opposite extremity, it becomes gradually harsher and adpressed, and at the apex, where the hairs are black, they are very harsh.

White, or brownish-white, varieties of this species (as well as of some others of the genus) sometimes occur : Mr. Gray regards his *M. albus* as one of these varieties. The posterior

incisor tooth on each side of the upper jaw (Pl. 5, figs. 1 and 2,) is longer from front to back in this species than in others which I have had an opportunity of examining[1], and has two external vertical grooves, one situated rather in front of the middle, and the second placed between this and the anterior margin. The size and proportions of the cranium are expressed in the subjoined dimensions.

	No. 1.		No. 2.		No. 3.		No. 4.		No. 5.		No. 6.	
	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.
Total length of skull . . .	7	6	7	0	6	7	8	2	6	6	6	11
Width	3	11	3	7	3	5½	4	4	3	2½	3	9⅓
Length of nasal bones . .	2	11½	2	9	2	10	3	6	2	9½	2	11½
Width of ditto at the base .	0	11	1	1½	1	0	1	2½	0	11	1	0¾
" " near the apex	0	8½	0	8	0	9	0	9⅛	0	7⅔	0	9¼
" between orbits . . .	...		1	3	1	4½	1	9½	1	6	1	5⅜
Length of palate	5	0	...		...		5	6	4	4	4	7½
Width of ditto opposite the third molar	1	2	...		...		1	5½	1	2¼	1	3⅜
Length of the four posterior molar teeth, taken together, on either side of either jaw	1	11	...		...		1	11	...	?	...	
" of the three incisors of either side of the upper jaw	0	9½	0	10	...		0	9½	...	?	0	9½
" of the posterior incisor from front to back	0	5	...		...		0	4¾	...	?	0	5
Distance between incisor and molar teeth of the upper jaw	2	8	...		...		2	8	2	4	2	1
Length of ramus of lower jaw	...		...		...		6	5	5	0½	5	6
Height in a vertical line dropped from the coronoid process	...		...		...		3	8	3	2	3	4

[1] Perhaps *M. fuliginosus* presents the same character: in *M. giganteus* the tooth in question varies somewhat as to length; the figures in Plate 5 give the extremes of variation I have met with.

	Adult Male. Brit. Mus.		Female. Brit. Mus.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of the nose to the root of the tail	63	0	42	0
" *of the tail*	42	0	28	0
" *from nose to ear*	8	4	7	3
" *of the ear*	4	9	4	0
Width of ditto	3	8		
Length of the fore-arm and hand (without the claws) .	17	0	10	0
" of the tarsus (without the nails or claws) . . .	15	6	12	3

The first three of the columns in the Table in the preceding page give the dimensions of skulls of ***M. giganteus***, but unfortunately the sexes of the specimens to which they belonged are not known; the remaining three columns of dimensions are from specimens of ***M. ocydromus*** in Mr. Gould's collection; the first (col. No. 4) gives the admeasurements of the skull of an adult male of very large size; it had the imperforate palate, and the general proportions, of ***M. giganteus***, and it will be seen that, notwithstanding its greater size, as compared with the skull, the dimensions of which are given in column No. 1, the size of the molar teeth is the same. The dimensions given in column 5 are from an adult female, weighing 50 lbs.: it had the three posterior molar teeth only remaining. The last column contains the admeasurements of an immature, though nearly adult male; it had four molar teeth on each side of each jaw, of which the foremost was a premolar; the last true molar was not developed.

I here subjoin descriptions of the ***M. ocydromus***, and ***M. melanops***, both of which appear to me specifically identical with the ***M. giganteus***.

Macropus ocydromus. Gould.

Fur short and somewhat woolly; general colour, brown-grey, slightly suffused with yellowish rufous, especially of the head and sides of the body; under parts, grey-white, tinted with yellowish rufous on the abdomen; muzzle brownish above, and at the sides, towards the tip; ears clothed at the base externally with sooty-brown fur, as well as the occiput, the remaining portions clothed with longish white hairs; limbs brownish white; fore-feet much pencilled with brown; the extremities of the toes black; tarsi slightly pencilled in front with brownish, the toes pencilled with blackish brown, and at the tip black; tail clothed, for a considerable distance from the base, with fur like that of the body both in texture and colour, but towards the apex the hairs gradually become harsher and adpressed; about eight or nine inches of the apical portion is brownish black; short hairs, like those on the tip of the muzzle, extend down on the muffle, terminating in a point in front, and leaving a naked space below of about 2¼ lines in width; there is a naked space, of less width, also, bordering the nostrils. Height of a full-grown male, in its ordinary upright position, four feet six inches.

	Inches.	Lines.
Length from tip of the nose to root of tail ...	58	0
" of tail	36	0
Circumference of ditto at the base, about	13	0
Length of fore-arm (not including the hand) ...	13	0
" of hand (without claws)	4	6
" of central claw of ditto	1	10
" of tarsus	15	0
" from nose to ear	7	10
" of ear	4	10

A female, procured by Mr. Gould from the Sand Plains, near "Wongar Hills," Western Australia, and which is said to have been accompanied by a young one, and was therefore mature when killed, weighed about 40 lbs.: its general hue was almost uniform pale rufous brown; the toes and fingers suffused with black at the extremity; the occipital portion of

the head was dusky; about five or six inches of the tip of the tail was also dusky, or blackish. Its dimensions, as nearly as they could be taken from an unstuffed skin, were—length from nose to root of tail, 3 feet; tail, 2 feet; tarsus and nails, 12 inches 6 lines; from nose to ear, $6\frac{1}{2}$ inches; ear, 4 inches.

The largest cranium I have seen of a Kangaroo belonged to one of these animals; its dimensions are given in column No. 4, with those of some skulls of *M. giganteus;* it is in Mr. Gould's collection, and is labelled as belonging to an adult male weighing 160 lbs.

The only difference which I can perceive between Mr. Gould's specimens of *M. ocydromus* and the *M. giganteus,* consists in the fur of the former being shorter: they varied somewhat in tint, and a specimen of a Kangaroo living at the Zoological Society's Gardens, which Mr. Gould regarded as his *M. ocydromus,* differs in being of a darker colour than usual, and, in this respect, approaches the *M. melanops.*

Macropus melanops. Gould.

Fur moderate as to length, and inclining slightly to a woolly texture (resembling that of *Macropus giganteus*); general colour of the upper parts, sooty brown, the upper surface of the head, and the back of the ears at the base, rather darker than elsewhere—nearly black; sides of body, and outer side of limbs, yellowish brown; fore-legs grey, the feet black; tarsi brownish white, slightly freckled with blackish towards the toes, which have a much greater admixture of brownish black, and at the end are almost entirely of that hue; tail clothed at the base with fur like that of the body, but the hairs become gradually shorter, more harsh, and are closely applied to the skin on the apical third, where they are black; ears clothed with white hairs internally; externally, excepting at the base, the hairs are black and white in about equal proportions. The lower part of the cheeks, throat, and chest, have a whitish hue, the hairs on these parts being white at

the point; but below the point they are grey, as are also the hairs on the abdomen, which are less distinctly tipped with white.

Length, from the tip of the nose to the root of the tail		37	0
"	of tail	24	6
"	of tarsi and claws	12	0
"	from tip of nose to ear	6	4
"	of ear	3	8
"	of fore-arm and hand to end of nails, about	10	0

The only specimen I have seen of the *M. melanops* is that in the British Museum, which is a male, and is the original of Mr. Gould's description. It has no skull, and hence I have no opportunity of examining and comparing its teeth with those of *M. giganteus*, from which species it differs only (so far as I can perceive) in having its fur of a much darker hue, it being much suffused with sooty black, and the upper surface of the head being almost entirely black.

MACROPUS FULIGINOSUS. Sooty Kangaroo.

Kangurus fuliginosus.	DESM. Nouv. Dict. d'Hist. Nat. tom. xvii. p. 35, Pl. E. 22 (K. géant). 1817. Mammal. pt. 1, p. 263. 1820.
Kanguroo géant.	F. CUVIER, et GEOFF. Hist. Nat. des Mamm. fasc. 2. 1819.
,, ,,	F. CUVIER, in Dict. des Sci. Nat. xxiv. p. 347. 1822.
Macropus fuliginosus.	LESSON, Manuel de Mamm. p. 225. 1827.
,, ,,	GOULD's Monogr. of the Macrop. pt. 2, Pl. 1.
,, ,,	WATERH. Nat. Libr., Marsupialia, p. 200. 1841.
,, ,,	GRAY, List of the Mamm. in the Collection of the Brit. Mus. p. 88. 1843.

About the same size as *Macr. giganteus:* general colour yellowish-brown; toes and apical third of the tail blackish; fur long, and inclining to a woolly texture: long fur, like that of the body, extends on to the base of the tail, covering rather more than one-third of its length; on the remaining portion the hairs are short and adpressed; a large dusky patch on

elbows; on the fore feet and tarsi the hairs are much pencilled with black; under parts of the body rather paler than the sides, which are of a bright yellowish tint; but here, as on the upper parts, the hair is yellowish-brown at the root: ear with whitish hairs internally, but somewhat dusky at the apical margin, brown-black externally; head uniform in colour with the body; around the angle of the mouth, and on the chin, are long black hairs.

	Male. Ins.	Male. Lines.	Female. Ins.	Female. Lines.
Length from nose to root of tail	57	0	43	0
,, *of tail*	30	0	25	0
,, *of tarsus (not including the nails)*	12	0	10	6
,, *of ear*	4	4	4	0

Inhabits Kangaroo Island? [From the Paris Museum.

A male and female of this species form part of the Paris collection; and Mr. Gould informs us, there is a third specimen in the Museum at Leyden. It is from the former, which are the originals of M. Desmarest's accounts, that the above description is taken.

In Péron's "Voyage aux Terres Australes" (tom. ii. p. 75), mention is made of two large species of Kangaroos as occurring in the I. Decrés (Kangaroo Island), and it is supposed that the present animal and the *M. rufo-griseus*, are the two species referred to; the only grounds, however, for this supposition, appear to be, that specimens of *M. fuliginosus* and *M. rufo-griseus* formed part of the collection brought home by Peron's expedition.

In size and general proportions the *M. fuliginosus* so closely resembles the *M. giganteus*, that I think it will probably prove to be a variety of that animal. The name Sooty Kangaroo is most ill applied to the present animal, since its colouring is any thing but sooty, being, for the most part, of a brownish-yellow, rather bright on the sides of the body, and somewhat suffused with dusky on the middle of the back. Some allowance, however, must be made for the long effects

of exposure to light, which has, no doubt, altered the colouring. Desmarest, whose first description was taken from these specimens about thirty years back, states the general colouring of the fur to be sooty-brown; darker on the back than on the flanks, and shaded into pale-grey on the under part of the neck, chest, and belly.

Sub-genus *Onychogalea.*

Genus *Onychogalea.* GRAY, List of the Specimens of Mammalia in the Collection of the British Museum, p. 88. 1843.

Muffle clothed with hair; posterior upper incisor as narrow as the anterior one, or narrower, and with a single vertical groove: general form slender; fore legs small; tarsi long and slender; tail also long and slender, and furnished with a horny excrescence at the apex.

This little section contains some of the most graceful and prettily-coloured species of the Kangaroo tribe: they are of moderate or small size, and have short fur.

MACROPUS UNGUIFER. Nail-tailed Kangaroo.

Macropus unguifer. GOULD, Proceedings of the Zoological Society for August, 1840, pt. 8, p. 93. Monograph of the Macropodidæ, pt. 1, Pl. 4.

Slender; tail very long; tarsi long; fore legs moderate; ears moderately long, and attenuated at the apex; fur very short, moderate as to texture; general tint, pale-reddish ochre, or fulvous; head, limbs, and tail, almost white; abdomen whitish; a palish-brown mark, commencing about the middle of the back, is continued over the rump, and extends along about four inches of the tail. This is clothed with small white adpressed hairs, but on the apical portion, commencing about eight or nine inches from the tip, is a slender black line on the upper surface, and this becomes gradually broader, and the dark hairs of which it is formed become also gradually longer, form a kind of crest, and, at the point of the tail, terminate in a long tuft, which hides a horny excrescence,

with which the tail is armed at this part; at the sides, the apical portion of the tail is brown, and beneath, where they are longer, they are brown-black. A whitish mark nearly crosses the haunches, running backwards from near the knee.

	Male. Inches.	Lines.
Length from tip of nose to root of tail ...	26	0
,, of tail	27	0
,, of tarsus, including the nail ...	7	6
,, from tip of muzzle to ear	4	0
,, of ear	2	7
Width of ditto	1	5
Length of fore arm and hand, including the nails, about	5	9
Height in ordinary erect position, about ...	22	0

Inhabits the north-west coast of Australia.

I believe the only specimen which has reached Europe of the interesting species, is that deposited in the British Museum by Mr. Bynoe, of Her Majesty's ship, The Beagle, which was procured by that gentleman on the north-west coast of Australia. It is beautifully figured by Mr. Gould, in his Monograph of the *Macropodidæ*.

The *Macropus unguifer*, so called from the circumstance of its tail being furnished at the tip with a nail-like horny excrescence, together with the *Macropus frænatus*, which has likewise a horny termination to the tail, form a little section, to which Mr. Gray, in his "List of the Specimens of Mammalia in the Collection of the Museum," (1843), gives the name *Onychogalea*. *Macropus lunatus* is very closely allied to these animals, and, like them, has the tail terminated by a horny excrescence.

The muffle in *M. unguifer* is covered with hair, with the exception of a very narrow margin next the nostril-openings; the foremost of the three incisor teeth on either side of the upper jaw is distinctly the broadest, the other two are very nearly equal in width; the hindermost has a strong oblique external fold; these teeth are small, compared with the

incisors of most Kangaroos. A canine tooth is present, but it is very small. The tarsi are very long and slender; the end of the nails of the double inner toe terminate 2½ inches short of the end of the nail of the great central toe; and the tip of the nail of the outer toe is 1½ inches short of the same point; the nails of the two larger toes are long, narrow, and much compressed above. The nails to the fingers are rather short and broad.

MACROPUS FRÆNATUS. Bridled Kangaroo.

Macropus frænatus. Gould, Proceedings of the Zoological Society for August, 1840, pt. 8, p. 92. Monograph of the Macropodidæ, pt. 1, Pl. 3.

Form slender: fur short and soft, general tint gray, being finely pencilled with black and white; under parts of the body, and inner side of the limbs, white; a white mark on the cheeks, beneath which is a dusky line: ears of moderate size, pointed, grey externally, but edged with black at the apex; internally with white hairs: muzzle blackish in front of the eye; two conspicuous white marks run backwards from the occiput, and diverging, pass one on each side over the shoulder, and are recurved at a short distance behind the insertion of the fore leg; the space between these lines is black on the occiput, and brownish-black on the back of the neck: sides of the neck suffused with pale-ochreous yellow: tarsi and arms nearly white; hands and toes dusky, but most of the hairs round the nails of the former are white: tail long, and rather slender, coloured like the body at the base, but black along the upper surface of the apical third, and at the point, where the hairs are longer than elsewhere, and hide a small horny tubercle, with which the tail is terminated; the under surface of the tail is of a dirty yellowish-white hue.

	Inches.	Lines.
Length from the tip of the nose to the root of the tail	18	0
,, of tail	14	6
,, of ear	2	4
,, of tarsus, including the nails	5	6
,, from nose to ear	3	0

Amongst the numerous new species of the Kangaroo tribe discovered by Mr. Gould, this is certainly one of the most elegant. Its form is slender, and the two white marks which run backwards from behind the ear, and terminate on each side of the body a little behind the base of the fore leg, add to its beauty: these marks are rendered the more conspicuous by the intervening space on the back of the neck being almost black. Mr. Gould states that its weight varies from ten to fifteen pounds. The nearest point to the colony of New South Wales at which he met with it, was Brezi, on the River Mokai, whence it extended into the interior. "It inhabits," says Mr. Gould[1], "all the low mountain ranges similar to those of Brezi, whose elevation varies from one to five or six hundred feet, and which are of a sterile character—hot, dry, stony, and thinly covered with shrub-like stunted trees * * *. When started from its seat, which is formed like that of a hare, and sheltered by a tuft of grass, or a small bush, it bounds away with remarkable fleetness, generally giving the best dogs a sharp run, and frequently effects its escape by gaining the thick part of the trunk, or the hole of a decayed tree; and I recollect, on one occasion, that on being sharply pressed, the animal mounted the inside of the tree to an opening nearly fifteen feet from the ground, whence it leaped down before the dogs, and succeeded in reaching the hollow trunk of a fallen tree, from which it was finally taken by the hand."

The female, as is usual in this group, is considerably

[1] Monograph of the Macropodidæ.

smaller than the male. The specimen from which the description here given was taken, forms part of the Zoological Society's collection, having been presented, together with a second, by Mr. Gould. This second specimen differs in having the back part of the head and neck grey. Specimens are also contained in the British Museum collection. The dimensions given by Mr. Gould of the male and female are as follows:—

	Male.		Female.	
	Ins.	Lines.	Ins.	Lines.
Length from nose to root of tail	24	6	17	6
" of tail	1	7	1	3
" of tarsus and toes (including the nails) ...	6	6	5	0
" of arm and hand (including the nails) ...	5	0	4	0
" from the tip of the nose to the base of the ear	3	9	3	6
" of ear	3	6	3	3

MACROPUS LUNATUS. Crescent-marked Kangaroo.

Macropus lunatus. Gould, Proc. Zool. Soc. Aug. 1840, p. 93.

Fur soft and short; general tint, ashy grey; neck rufous; body beneath, grey-white; a distinct curved white mark behind the insertion of the fore-leg; feet whitish; ears rather long and attenuated; tail moderate, with a short crest of blackish hairs on the apical portion, the tip furnished with a small conical horny excrescence.

Inhabits the Swan River District, Western Australia.

About the size of a rabbit; fur very soft, and by no means long; general tint ashy grey, finely pencilled with dusky and yellowish-white; back of neck and shoulders, vinous rust colour; at a short distance behind the base of the fore-leg is a distinct curved white mark. Fur on under parts of the body pale grey, the hairs tipped with dirty-white; on the

sides of the body a faint rusty tint is observed (sometimes the rufous tint on these parts, as well as the fore-part of the hind legs, is tolerably distinct); around the eye is a ring of a very pale rust colour, and the muzzle is suffused with the same tint. The ears are rather long and attenuated at the apex, have long white hairs within, and very minute hairs externally, which are dusky and very finely freckled with yellowish white; on the hinder half, the hairs are longer and almost white; the apex of the ear has a delicate fringe of blackish hairs. Fore-feet small, sometimes brown, and sometimes of a dirty-white colour. Tarsi also small, slender, and chiefly of a dirty-white colour; but the sides of the toes are suffused with palish brown. The tail is clothed for the most part with short adpressed hairs, having a general greyish tint; the upper surface is clothed throughout its length with somewhat longer hairs; on the apical portion they form a slight crest, which is usually blackish, and the under surface at the end of the tail is dusky; the tip of the tail is provided with a small conical horny appendage, like a nail, which is about an eighth of an inch in length.

			Male.—Brit. Mus.	
	Ins.	Lines.	Ins.	Lines.
Length from nose to root of tail	14	6	19	0
" " ear ...	2	2	3	0
" of tail	8	6	13	3
" of tarsus and claw ...	4	0	5	0
" of ear	1	8	2	7
" of fore-arm and hand to end of claws, about ...	1	11	3	10

The cutting edges of the upper incisor teeth, in the present species, terminate nearly all on the same plane; the three incisors on either side of the upper jaw are small, and of equal width, or perhaps the foremost rather exceeds the other two; this tooth has a longitudinal groove: the second incisor has no groove, and is somewhat rounded at the point: the third, or hindermost incisor, has an oblique external fold,

and sometimes exhibits a mere notch rather behind the middle. The lower incisors are rather short and pointed. The fore feet are small, the central toe the longest, and the outer ones are very nearly equal in length. The hind feet are slender, and the nails of the toes are pointed, and rather small and slender; the nails of the double toe terminate about in a line with the middle of the nail of the outer toe, which is also the case in *Lagorchestes albipilis*.

Sub-genus *Lagorchestes*.

Lagorchestes. GOULD, Monograph of the Macropodidæ, Part I.

Muffle clothed with velvet-like hairs; posterior upper incisor teeth small, the hindermost with a single vertical groove: tarsi and claws slender; fore legs small, the hands also small, and with smallish sharply pointed nails.

Mr. Gould separates from the Kangaroos which have the muffle clothed with hair, a group of small species, some of which bear considerable general resemblance to our common hare[1] (*Lepus timidus*), a resemblance, however, which is due chiefly to the texture and colouring of the fur, combined with the size of the animals. If compared with the Great Kangaroo, they differ considerably in the structure of their upper incisor teeth, the foremost pair being the broadest, and the hindermost incisor on either side being small, and about equal in width to the second, and this tooth has but one external vertical fold: these differences, however, are likewise observed in some other species of Macropus (as in *M. lunatus*), though perhaps in a rather less marked degree.

In separating as a distinct genus the present group, Mr. Gould was impressed with the idea, that the species of which it was composed were closely allied to the Kangaroo-rats, observing, with reference to the *Lagorchestes leporoïdes*, "that although belonging to that subdivision of the family

[1] The sectional name is derived from λαγος, a hare, and ὀρχηστης, a dancer.

which includes the Rat- and Jerboa-Kangaroos, it differs from them in inhabiting a different character of country (that is, the open plains), in having a hairy muzzle, and in the hands and nails being smaller, more slender, and more delicately formed than any other known species; points indicating that it is not a burrowing animal; and it is apparent, from the sharpness and spiny form of the fore-nails, that they are never used for the purpose of obtaining roots, as is decidedly the case with the Rat- and Jerboa-Kangaroos." But why assume that *Lagorchestes leporoïdes* is allied to the Kangaroo-rats, there being so much difference in the structure of the limbs, and the muffle being hairy? In these characters *L. leporoïdes* agrees with *M. lunatus* and its allies; and, in addition to this, I find the structure of the skull and teeth to be very different to that of the Kangaroo-rats[1], and, in fact, distinctly upon the same type as the true Kangaroos, which also, like *Lagorchestes*, inhabit the open plains. That *Lagorchestes* forms a natural group I admit, but I cannot regard it as entitled to the rank of a genus.

MACROPUS (*Lagorchestes*) LEPOROÏDES.

The Hare-Kangaroo.

Macropus leporoïdes.	GOULD, Proceedings of the Zoological Society for August 1840, p. 93.
" "	WATERH. Marsupialia, p. 204.
Lagorchestes leporoïdes.	GOULD, Monogr. Part 1, Plate 12.

Fur long and soft; on the upper parts of the body variegated with black, rust colour, and rusty white, the white most conspicuous, and the rust colour but little seen; the back of the neck and shoulders, and a considerable space round each eye, tinted with palish rust colour, sometimes inclining to

[1] See the account of the Kangaroo-rats, or Hypsiprymni.

buff yellow ; sides of the body and haunches suffused with rust colour ; under parts grey-white, tinted with rust colour, but nearly pure white between the hind legs. Fore legs with a more or less strongly marked black patch at the base externally, but the hairs on this part pencilled with white ; fore arm and hand with short brown hairs, pencilled with very pale brown : on the middle of the tibia is a dusky patch : tarsi impure palish rust colour, finely freckled with brown ; toes brownish : tail clothed throughout with small adpressed hairs, which are partly black and partly white ; beneath brown-white.

Inhabits South Australia.

This pretty little Kangaroo is nearly equal in size to the common Hare (*Lepus timidus*), and very much resembles that animal in the texture and colouring of its fur, circumstances which suggested the specific name. The head is rather short ; the ears moderately long, attenuated, and somewhat pointed at the apex ; internally well clothed with long white hairs, externally clothed with small black and white hairs : the upper lip is white ; the tip of the muzzle completely clothed with minute brown hairs. The tarsi are long ; the nails of the toes long, slender, and sharply pointed ; the fore legs very small and delicate ; the toes armed with slender nails. The tail is slender, and of moderate length. The fur of the back is nearly black next the skin ; each hair has this black portion, which is of considerable extent, followed by reddish-brown ; then a long space, which is rusty-white, and the tip is black : on the belly and chest the hairs are grey at the base, and rusty grey-white externally ; between the hind legs they are white throughout. The foremost incisor tooth of the upper jaw is the largest, and the hindermost one, which has a distinct notch, is the smallest of the three on either side of the jaw. At a short distance behind the incisors is a small slender canine tooth.

	Inches.	Lines.
Length from nose to root of tail	19	6
" of tail	12	0
" of tarsus	5	7
" from nose to ear	3	5
" of ear	2	2
" from elbow to end of nails, about ...	3	4
" of skull	3	2
Width	1	10
Length of nasal bones	1	2½
Width at base	0	7
" near apex	0	3½
Length of frontals	1	1
Interorbital space	0	8
Length of palate	1	8½
" of three incisors	0	4
" from incisors to molar	0	8¼
" of premolar and three molars, taken together	0	10
Height of lower jaw	1	3¼
Width from back of condyle to front of coronoid process	0	8

The following observations relating to the Hare-Kangaroo are from Mr. Gould :—

"This singular little Kangaroo, which I have made the type of a genus, ranges widely over the interior; it is tolerably abundant in all the plains of South Australia, particularly those situated between the Belts of the Murray and the mountain ranges: I also hunted it successfully on the Lower Namoi; and skins were presented to me by the Messrs. Coxen, who, I believe, had obtained them on the Liverpool plains. Judging from what information I could gather respecting it, I believe it to be peculiar to the interior, and never to frequent that portion of New South Wales which lies between the ranges and the coast. * * *.

"The name of Hare-Kangaroo has been given to this species as much from the similarity of its form, its size, and the colour and texture of its fur, as from its habits assimilating in many particulars to those of the hare. I usually found it solitary, and sitting close, in a well-formed seat,

under the shelter of a tuft of grass on the open plains: for a short distance its fleetness is beyond that of all others of its group that I have had an opportunity of coursing. Its powers of leaping are also equally extraordinary. I may mention an incident connected with the chase of the animal, which occurred to myself. While out on the plains in South Australia, I started a Hare-Kangaroo before two fleet dogs; after running to the distance of a quarter of a mile, it suddenly doubled, and came back upon me, the dogs following close at its heels: I stood perfectly still, and the animal had arrived within twenty feet before it observed me, when, to my astonishment, instead of branching off to the right or to the left, it bounded clear over my head, and on descending to the ground, I was enabled to make a successful shot, by which it was procured.

"Considerable diversity of colour is observable in different specimens, some being much redder than others; but the sexes are scarcely distinguishable by size."

Fig. 17, of Plate 5, represents the skull of the natural size; and fig. 17*a* shows the form and relative positions of the superior incisors, the canine, and three of the molar teeth.

MACROPUS (*Lagorchestes*) CONSPICILLATUS.

Spectacled Hare-Kangaroo.

***Lagorchestes conspicillatus*. Gould, Proceedings of the Zoological Society for October, 1841, Part ix. p. 82. Monograph of the Macropodidæ, Part 2, Plate 13.**

In size, and in the colouring and texture of the fur, greatly resembling the Common Hare (*Lepus timidus*). Fur long and loose; on the upper parts of the body the hairs are black, but the curved and exposed ends are rusty-white, shaded through rusty-brown to black, which is the colour of the point; the whitish part is most conspicuous; sides of the body pale brownish rust colour; under parts brownish-white; the hairs here almost uniform to the root: an indis-

tinct whitish mark crosses the haunches; fore legs and tarsi brown-white, but the hairs on these parts are blackish at the root; hands brown-white, slightly pencilled with blackish: tail rather sparingly clothed with small pale hairs; ear very short, narrow at the apex, clothed internally with pale hairs; externally, with hairs which are partly dusky and partly white: around each eye is a broad space, of a rich and bright rusty red colour: sides of the muzzle whitish, the tip above nearly black.

	Female.—Brit. Mus. Inches.	Lines.
Length from tip of nose to root of tail ...	18	6
" of tail	13	9
" of tarsus and claw	5	6
" from nose to ear	3	4
" of ear	1	3
" of fore arm and hand, to end of claw, about	3	6
Height, in ordinary erect position, about ...	14	0

From Barrow Island, north-west coast of Australia.

This species, so remarkable for its general resemblance to the Common Hare, may be distinguished from the *M. leporoïdes* by its ears being considerably shorter, the more brilliant rusty-red colouring round the eye, and the want of the black patch at the base of the fore leg: the muzzle, likewise, is more obtuse. In *leporoïdes* the muffle is entirely covered with velvet-like hairs, but in the present species there is a distinct naked margin next the nostrils, and a small naked space in front. Lastly, may be noticed, the structure of the fore legs and hands, which are larger and stronger than in *leporoïdes*: in this latter animal the hand is about 5½ lines in width, whilst in *M. conspicillatus* it is about 8 lines. The foremost incisor tooth of the upper jaw is the broadest, and the last is rather broader than the second, and has an oblique external fold. These teeth are small, as in *M. unguifer*, and indeed in most of the species having the muffle hairy, if we except the *M. giganteus*.

But two specimens of this species have been brought to

Europe, and it is to Captain Wickham and Mr. Bynoe, of H. M. S. The Beagle, that its discovery is due. The female, from which the above description was drawn up, was presented by the former of these gentlemen to the British Museum. Both the specimens were found on Barrow Island, which lies off the north-western coast of Australia, about thirty miles from the main land.

MACROPUS (*Lagorchestes*) FASCIATUS.

Banded Hare-Kangaroo.

(*Plate* 4, *Fig.* 2.)

Kangurus fasciatus.	PÉRON et LESUEUR, Voyage aux Terres Australes, tom. i. p. 114, Plate 27.
" "	DESMAREST, Mammalogie, Part 1, p. 274.
Halmaturus elegans.	CUVIER, Règne Animal, tom. i. p. 187.
Bettongia fasciata.	GOULD, Monograph of the Macropodidæ, Part 2, Plate —.
Lagorchestes albipilis.	GOULD, Annals and Magazine of Natural History for Sept. 1842, Vol. x. p. 2.

About the size of the Common Hare (*Lepus timidus*): ears moderate, attenuated at the apex; fore feet very small; tail about as long as the body; fur very long and soft, brown-grey, variegated with rust-colour, black and white; around the eye of a brightish rust-colour: numerous transverse narrow dark bands adorn the back, and are most conspicuous on the hinder part: on the whole of the upper parts and sides of the body, are very long interspersed white hairs; under parts of body dirty-white: the hairs springing from the sides of the two larger toes of the hind feet are very long (being many of them nearly an inch in length), rather harsh, and of a brownish-white colour.

Inhabits Western Australia.

The specimens of *Macropus fasciatus* in the Paris Museum being very old, have had the hair worn off from the tip of the muzzle, from which circumstance Mr. Gould (supposing

the muzzle to be naturally naked at that part in the specimens in question) was deceived as to the section to which they belonged, and placed them in the genus *Bettongia*, and founded a new species, under the name *Lagorchestes albipilis*, upon some skins received from Western Australia agreeing with *M. fasciatus*, but which he imagined differed in having the muffle hairy. Upon a recent careful examination of the Paris specimens, I found that some few of the small hairs still remained, and indeed were distinct in one of the specimens, where, being in a hollow, they had not been exposed to friction.

In a skeleton of the *M. elegans*, contained in the Museum of Comparative Anatomy at Paris, I noticed that the molar teeth had distinct, and considerably elevated, transverse ridges, as in *Macropus;* that the foremost incisor tooth of the upper jaw was rather the narrowest of the three; the second and third incisors were very nearly equal, the latter had a distinct external notch; the first molar was shorter than in Hypsiprymnus, and had three external grooves; there were no canine teeth, and the nasal portion of the cranium was short. Canine teeth are absent in all Mr. Gould's specimens of *Lagorchestes albipilis* which I had an opportunity of examining, and the structure of the incisor teeth is as above described; they are represented in Plate 5, fig. 4. The fur of this animal is very long and soft; the ears of moderate size, and somewhat pointed; the tail about equal to the body in length; fore legs and feet very small, and the claws slender; tarsi slender, and of moderate length; the nails of the toes also slender, compressed, and concave beneath. The general colour of the fur is greyish, but it is variegated with black, white, and rust colour; the last-mentioned colour is most conspicuous around the eyes: on the back are numerous transverse, narrow, black bands; these are somewhat irregular, and not well defined; the

spaces between the bands are partly of a rust colour and partly whitish; the white joins the dark band, and is gradually shaded into rust colour, to be followed by the next dark band; over the shoulders the bands are wanting. On the whole of the upper parts of the back, as well as on the sides of the body and the cheeks, are numerous very long interspersed hairs, which have the exposed portion white, but which, like the hairs which form the ordinary fur, are nearly black at the root. The under parts of the body are dirty white, having a considerable admixture of grey, the hairs being of the latter colour below the points. The ears have longish white hairs on the inner side; on the outer side the hairs are short, and finely freckled with brownish black, and white, the dark colour prevailing on the fore part, and the hinder part being entirely pale. The fore feet are of a dirty rust colour; the tarsi rusty white (or pale rust colour), and pencilled with blackish; the sides, both of the tarsus and toes, are chiefly of a very pale brown colour. The tail is rather slender, tolerably well covered with short adpressed hairs, the prevailing tint of which is brownish-grey; on the under side of the tail the hairs are somewhat longer, and of a brownish-white colour; on the upper surface is a narrow blackish streak, and on the apical third the hairs are longer than elsewhere, and form a small dark crest; at the point of the tail they are sometimes an inch in length. The muffle is entirely clothed with hair, with the exception of a small space in front, and a narrow line next the nostril openings.

The above description is taken from one of Mr. Gould's specimens of *Lagorchestes albipilis*, now in the British Museum, and agrees so perfectly with my notes made upon the specimens of *Kangurus fasciatus* in the Paris Museum, that it is unnecessary to make any extracts from those notes. I shall here subjoin their dimensions, together with those of the specimen above described:—

	Male. In Paris Mus.		Female. In Paris Mus.		British Museum.	
	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.
Length from tip of nose to root of tail	17	6	17	6	17	0
" of tail	12	0	11	0	12	0
" of tarsus, including the nails	4	3½	4	7	4	3
" of fore arm, hand, and nails, about	3	4	3	4	3	2
" of ear	1	6	1	7	1	8
Width of ditto at the base	1	4	1	5	1	6
Length from nose to ear	3	6	2	11	3	0
" of the three upper incisors, taken together ...	0	3½	0	3½	0	3½

This pretty little animal is noticed in Dampier's Voyage, but was first carefully described and figured by Péron and Lesueur, in their account of the "Voyage aux Terres Australes;" who, moreover, brought home the specimens which are contained in the Paris collection. These were procured in the islands in Shark's Bay, on the west coast of Australia. It is said by these authors to inhabit the impenetrable low thickets, formed of a species of *Mimosa*, which are found in those islands; from these bushes they cut away the lower branches and spines, so as to form galleries communicating one with another, and where they take refuge in time of danger. The female brings forth but one young at a time.

Although abundant in the islands of Shark's Bay, Péron states that none were to be found on the main land. These little Kangaroos (as is the case with all those feeble animals which have neither the power of attack nor of defence) are, like the Hares, extremely timid. The slightest noise caused them to take flight to the thick brushwood in which their galleries are formed, and where it is impossible to pursue them: hence, although very common, they are difficult to procure.

The flesh of these animals is said to resemble that of the Rabbit, but has a slight aromatic flavour, arising, probably,

from the nature of the plants on which they feed, nearly all of which are fragrant.

At the time that Péron visited the islands, all the females carried young in their pouch, and the courage with which they sought to save their offspring was truly admirable: although wounded, they flew with the young in the pouch, and never left them until, overcome with fatigue and loss of blood, they could no longer carry them; they then stopped, and squatting themselves on the hind legs, helped the young to get out of the pouch by means of the fore feet, and sought to place them in a situation favourable for retreat.

MM. Péron and Lesueur being unsuccessful in finding the Fasciated Kangaroo on the main land, imagined it was confined to the islands; such, however, is not the case, since M. Priess, an assiduous collector, has recently found it on the main land of Western Australia. The following notes, by Mr. Gilbert, upon the present species, are from the Proceedings of the Zoological Society for February, 1844.

"With respect to the Kangaroos, I have heard of the little silver-haired Lagorchestes (*Lagorchestes fasciatus*), and have tried hard to procure a specimen. It is a species well known to the natives of Moore's River, by whom it is called 'Nar-nine,' and is only to be found in densely thick scrubs on flats, and on the edges of swamps, where the small brush Melaleuca grows so thickly that it is almost impossible for a man to force his way through; its runs being under this, the animal escapes even the quick eye of a native. The only possible means of obtaining it is by having a number of natives to clear the spot, and two or three with dogs and guns to watch for it. *

"This beautiful little animal makes no nest, but squats precisely like a Hare, as I have been assured by Mr. Johnson Drummond."

MACROPUS (*Lagorchestes*) HIRSUTUS.

Rufous-haired Hare-Kangaroo.

Lagorchestes hirsutus. GOULD, Proceedings of the Zoological Society for February 1844, p. 32.

Fur long; general tint grey-brown, much suffused with rufous on the hinder parts of the body; legs of a bright rust colour; very long rust-coloured hairs are abundantly interspersed with those forming the ordinary fur, more especially on the hinder parts of the body; under parts rusty white; eye broadly encircled with rust colour; ears moderately large, and rounded at the extremity; tail moderate, clothed with small stiff hairs, which scarcely hide the scaly skin beneath; those on the upper surface of a brownish black hue; on the under, paler.

Inhabits Western Australia.

This species is nearly equal to the common Hare in size; its fur is long and moderately soft; the upper parts of the body are grey, much tinted with rufous brown, and freely pencilled with white; the sides of the body, rump, hind and fore legs, of a bright rust colour, darkest on the hind legs, and least distinct on the fore legs; the throat, chest, and mesial line of belly, rusty white; the crown of the head, grey; a broad space around the eye is of a bright, but palish rust colour, and this tint extends on to the muzzle; a whitish line on the upper lip runs back past the angle of the mouth. The ears are moderately long, rather broad, rounded at the tip, and have longish white hairs internally; externally, they are pencilled with rusty yellow, and dusky; the former tint, however, prevails; the hinder half is almost entirely clothed with small white hairs. The fore feet are clothed with glistering yellowish white hairs; the tarsus is almost entirely of a pale-rust colour, but rusty white towards the hinder part; and the toes are obscurely suffused with brownish rust colour. The

tail is clothed throughout with short, stiff, adpressed hairs, scarcely hiding the scaly skin; they are finely pencilled with black and rust colour at the base of the tail, but on the upper surface they soon assume an uniform brown black tint, which is continued to the point; on the under surface they are of a dirty pale rust colour, and towards the apex (about one inch from the point) is a naked scaly space of about an inch in length. The fur on the back is very nearly black next the skin, but a considerable portion of each hair is of a brownish rust colour; near the point the hairs are broadly annulated with white; and at the point, they are dusky or black. On the belly the fur is ashy grey next the skin.

	Inches.	Lines.
Length from nose to root of tail	17	0
" " to ear	3	6
" of tail	11	6
" of tarsus and claws	5	2
" of fore leg to end of claws	3	0
" of ear	1	9

The front incisor in *L. hirsutus* is very large (very much larger than the others); as broad as the one next to it and half the third taken together. The second is a larger tooth than the third, being longer and broader at the base; but the third, which is very short in the vertical direction, is more dilated at the apex, and presents a strong oblique groove on the outer side. The second tooth also has a groove, but this is scarcely perceptible on the outer side of the tooth; it traverses the crown of the tooth in the longitudinal direction, and is deeply indented on the under part of the tooth. I did not see this groove in the second incisor in a female specimen, which was perhaps older, and had the crown of the tooth more worn. This animal has a minute canine, which, when it was alive, could scarcely have penetrated the gum; it shows, however, in the skin, and is situated at the distance

of about 1½ lines from the incisors. The length of the three upper incisors taken together is 4 lines. (See Plate 5, fig. 5).

Mr. Gould says of this animal, that it is known to the natives of the York district, Western Australia, by the name "Woo-rup." It is distinguished from others of its genus by the long reddish hairs which are abundantly mingled with those of the ordinary fur on the hinder parts of back, and especially near the base of the tail.

The above description is drawn up from one of Mr. Gould's specimens now in the British Museum collection.

Sub-genus *Halmaturus*.[1]

***Halmaturus*. F. Cuvier.**

Kangaroos in which the muffle is naked in front; inhabitants, generally, of districts which are well clothed with shrubs.

The species of the present section agree in all *essential* characters with Macropus proper, differing only in having the muffle but partially clothed with hair. If a line drawn across the muzzle from the posterior angles of the nostrils be regarded as marking the hinder boundary of the muffle, the hair may be said to cover, usually, about half of the part in question, being continued forwards from the muzzle so as to cover a triangular area, the apex of which is situated in front. In the greater portion of the species, the point of termination is in a line with the middle of the nostril openings; sometimes it is rather in advance of that line, as in *M. agilis;* and sometimes the area which is clothed is in the form of an obtuse angled triangle, and then terminates somewhat behind the line drawn across from the middle of the nostril opening, as in *M. antilopinus* and *M. robustus*.

[1] From Ἅλμα-ατος, leaping; and οὐρὰ, tail.

I do not find any constant modification either in the structure of the skull, teeth, or extremities, combined with the differences of the muffle observed in *Macropus* (as restricted) and *Halmaturus*.

Some of the species of the present convenient, but, as it appears to me, arbitrary division, are of very large size, being in this respect equal, or but little inferior to, the *M. giganteus*, and, like that animal, have no large openings to the hinder part of the palatine portion of the skull; such are the *M. antilopinus*, *M. robustus*, and *M. rufus*.

MACROPUS (*Halmaturus*) ANTILOPINUS.

Antilopine Kangaroo.

Osphranter Antilopinus. GOULD, Proceedings of the Zoological Society for October 1841, Part 9, p. 80.—Monogr. Part 2, Plate 7.

Male.—Fur short; the hairs stiff and closely applied to the body; the sides and under parts of the body, as well as the inner parts of the limbs, of a very pale rusty yellow, and the upper parts of a bright rusty red. This tint is extended on the outer side of the legs, and on the feet, but the toes are black: tail slightly suffused with rust colour, and dusky at the apex above; ears, with pale hairs internally: height, in ordinary position, about four feet.

Female.—Considerably smaller, and with the fur longer, less harsh, and less closely applied to the body, than in the male. General tint brown; greyish over the back of the neck and shoulders, suffused with rust colour, and pencilled with blackish on the back; under parts and limbs rusty white; fore feet brown, but with black hairs near the claws; hind feet pencilled with blackish in front, and shaded through brown into black on the toes; cheeks, upper lip, and chin, dirty yellow white; upper surface of muzzle brownish: height, about three feet.

Inhabits North Australia.

The only two perfect specimens of this fine animal at present in Europe are those which form the subject of one of the plates in Mr. Gould's Monograph. They now grace the collection of the British Museum, and their discovery is due to Mr. Gould's zealous assistant, Mr. Gilbert, who procured them, together with many other novelties, at Port Essington.

Captain Chambers, who placed several imperfect skins of the Osphranter or Antilopine Kangaroo in Mr. Gould's hands to assist him in his study of the group, informed him that he had seen individuals which were one hundred and seventy pounds in weight, indicating that the present species attains a size nearly one-third larger than the male specimen in the British Museum, that having weighed about one hundred and twenty pounds.

The same gentleman informs Mr. Gould that when hardly pressed in the chase, the Osphranter becomes exceedingly fierce and bold, and, while among the rocks, is a most dangerous animal to encounter, one of his finest dogs being tumbled over a precipice and killed by an old male.

Unlike most Kangaroos, where the fur is long, and the under fur, being abundant, is loosely applied to the body, the Antilopine Kangaroo is clothed with short stiff hairs, and these lie close to the skin, as in many of the Antelope tribe; a peculiarity which suggested the specific name. The present species is remarkable, moreover, for the great expanse of the nasal cavity of the skull; a character which induced Mr. Gould to regard it as the type of a new genus or subgenus, for which he proposed the name *Osphranter*. The character in question, however, I can but regard as a specific peculiarity. The muffle is very broad; the fore legs large and powerful, and the fore feet are furnished with very strong claws; the hind legs and feet are comparatively rather shorter than in the Macropus *giganteus;* the central toe is very large, whilst the two united toes, as well as the outer toe, are

unusually small: the former terminate in a line with the latter, or very nearly so.

The following dimensions are from the male and female Antilopine Kangaroos, figured by Mr. Gould in his Monograph, and which are in the British Museum:—

	Male.		Female.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	53	0	39	0
" of tail	36	0	30	0
" of tarsus and nails ...	13	3	11	6
" from nose to ear ...	7	9	5	9
" of ear	4	0	4	0
" of fore arm and hands, including the claws ...	15	0	10	0

The skull of *Macropus antilopinus* is about equal in size to that of *M. giganteus*, but is shorter in proportion to its width; and the most striking difference is in the form of the muzzle, which, instead of becoming gradually narrower towards the apex, is quite as broad near the end as at the base, and is most broad rather in front of the middle; the nasal bones are shorter than in *M. giganteus*; the superior breadth of the muzzle is caused by the swelling outwards of the superior maxillary and nasal process of the intermaxillary bones, which thus gives a great expanse to the nasal cavity, which encloses very largely developed turbinated bones, and hence we may conclude the Antilopine Kangaroo possessed unusual acuteness of smell. The frontal bones are deeply concave above, between the orbits, and are much contracted immediately behind them; the temporal ridges meet to form a well-marked sagittal crest. The zygomatic arch is thrown more boldly outwards than in the *M. giganteus*, and is remarkable for its great depth; the lower posterior branch of the malar bone descends slightly below the level of the glenoid cavity; the palate is strongly concave in the longitudinal direction; the ordinary posterior palatine openings,

situated in the palato-maxillary suture, are here represented by two very small perforations of about one line in length, and behind these are some other very small perforations; in fact, the palate is as entire as in *M. giganteus*. The foremost incisor tooth (see Pl. 5, fig. 15,) is but little broader than the second; the third is about double the width of the second, has a strong oblique external groove rather in front of the middle of the tooth, and there is a second groove in front of this, but this latter, which represents the foremost of the two grooves observed on the incisor of *M. giganteus*, is much less distinct than in that animal. In an adult skull I have seen the full number of molar teeth; but the cranium of a very aged individual presented but thirteen molar teeth in both jaws. The subjoined dimensions are from two skulls in the collection of Mr. Gould; the specimens were procured near Victoria, in North Australia, and the larger skull is said to have belonged to an animal weighing one hundred and twenty pounds, the largest which had been seen :—

	Male.		Female.	
	Ins.	Lines.	Ins.	Lines.
Total length of skull	7	1	6	0
Width	4	2	3	5½
" between orbits	1	2½	1	2
Length of zygomatic arch	3	1	2	7½
Depth of ditto behind	1	3½	1	0
Length from anterior root of zygoma to apex of intermaxillaries ...	3	6	3	1½
Width of muzzle in the middle ...	1	11	1	9
Length of nasal bones	2	11	2	6
Width of ditto behind	1	1½	1	1¾
" near the apex	0	11	0	9⅓
Length of palate	4	8	4	0
" of three anterior incisors taken together	0	9	0	8¼
—of which the posterior incisor is ...	0	4½	0	4½
Distance between incisors and premolar	1	10	(?)	
Length of the five molar teeth taken together	2	2½	(?)	
" of the lower jaw	5	7	4	8
Height of ditto, from the apex of the coronoid process	3	2	2	0

MACROPUS (*Halmaturus?*) ISABELLINUS.

Isabelline Kangaroo.

Osphranter (?) isabellinus. GOULD, Proceedings of the Zoolog. Society for October, 1841, Pt. 9, p. 81.

The Yellow Wallaroo. GRAY, Catal. of the Mammalia in the Collection of the British Museum, p. 92.

Fur somewhat short and soft, and of a bright fulvous, or sandy red colour; throat, under parts of the body, and limbs, whitish, somewhat tinted with pale yellow in parts; fore feet and toes brown, the sides of the latter yellowish: tail of a somewhat paler hue than the body.

Inhabits Western Australia.

This species is founded by Mr. Gould upon a flat and imperfect skin, procured at Barrow Island, on the west coast of Australia (latitude about 21°), by Capt. Stokes, of H. M. S. Beagle, and which is now deposited in the British Museum. The characters of the animal, so far as they can be ascertained from such imperfect materials, are thus given in the Proceedings quoted:—The general colour of the skin is bright fulvous, or sand-red; the fur is rather short, and soft to the touch; the hairs are uniform in tint to the base: the throat and under parts of the body are white, faintly tinted with yellowish in parts. The fur on the belly is long, and very soft: the white or whitish colouring of the under parts, and the uniform fulvous colouring of the upper parts and sides of the body, do not blend gradually: the colour of the tail is nearly the same as that of the body, but is rather paler, and is nearly uniform. The fore-feet and toes above, are covered with brown hairs, but on the sides of the toes the hair is yellowish. The size of the animal is probably about equal to that of *Halmaturus Bennettii*.

MACROPUS (*Halmaturus*) ROBUSTUS.
Great Rock Kangaroo.

(*Plate 7.*)

Macropus (Petrogale) robustus.	GOULD, Proceedings Zool. Soc. for August, 1840, Pt. 8, p. 92.
Petrogale robusta.	GOULD, Monograph of the Macropodidæ, Pt. 1, 5th Plate.
Macropus robustus.	WATERHOUSE, Marsup. p. 241.

Black Wallaroo of the colonists.

Male.—Fore legs powerful; tarsi short: fur rather short and harsh, general colour very deep slate grey, slightly suffused with brownish on the upper parts of the body; the under parts rather paler than the upper; chin with a black patch; ears white internally, and brown externally; feet black; hind feet sooty black, but paler on the inner side near the heel. Height about 3 feet 6 inches.

Female.—Much smaller than the male: general colour silvery-grey, slightly tinted with purple on the back; the under parts nearly white; fore-feet brown, toes blackish; hind feet pale, but with the toes brown-black.

Inhabits the mountain ranges in the interior of New South Wales.

According to the observations of Mr. Gould, the Great Rock Kangaroo inhabits the summits of sterile and rocky mountains, from which it seldom descends to the coverts at their sides, and never to their base. As yet it has only been found in the south-eastern portion of the continent, and is said to be tolerably abundant in the Liverpool range. Mr. Gould ascertained that it also inhabited many of the hills which branch off on either side of this great mountain chain, both towards the interior as well as towards the coast.

This species is extremely agile among the rocks, and its retreats are so well chosen among the crags and overhanging

ledges, that it is nearly useless to attempt its pursuit and capture with dogs. It is a formidable, and even dangerous, animal to approach, for if so closely pressed that it has no other chance of escape, it will rush at and force the invader over the edge of the rocks, as the Ibex is said to do under similar circumstances. Independently of its great muscular power, this animal is rendered still more formidable by the manner in which it makes use of its teeth, biting its antagonist with great severity.

The *Macropus robustus*, Mr. Gould further observes, "may be regarded as a gregarious animal, four, six, and even more, individuals being frequently seen in company. On one of the mountains near Turi, to the eastward of the Liverpool Plains, it was very numerous; and from the nature of this and the other localities in which I observed it, must possess the power of existing for long periods without water, that element being rarely met with in such situations. The summits of the hills to which this species resorts soon become intersected by numerous roads and well-trodden tracks, caused by its repeatedly traversing from one part to the other: its food consists of grasses, and the shoots and leaves of the low scrubby trees which clothe the hills it frequents.

"Although much shorter in stature, and consequently less elegant in form, the fully adult male *M. robustus* equals in weight the largest specimens of *Macropus giganteus*; and so remarkable is the difference in the colour and size of the sexes, that had I not seen them together in a state of nature, I should have considered them to be different species, the black and powerful male offering so great a contrast to the small and delicate female."

The *Macropus robustus*, as compared with the Great Kangaroo (*Macropus giganteus*), differs in having the tarsi shorter, and the fore legs larger and more powerful; the fur is

rather short, and has a somewhat shaggy appearance, especially about the head; its general colour is of a very deep slate-grey, obscurely suffused with brownish; the tarsi are brown behind, and gradually shaded into black on the fore part; the toes black, and the fore feet and wrists are also black; the upper side of the fore arm is brownish; the hind legs somewhat sooty, but pale on the inner side, especially near the heel; the head is nearly uniform in colour with the body, but slightly suffused with blackish at the tip of the muzzle on each side; a narrow white line is observed round the angle of the mouth; the lower lip is white, and there is a black patch on the chin; the throat and fore part of the neck are whitish; the under parts of the body are a trifle paler than the upper parts: the tail is brown above, and pale-brown beneath. The hairs on the back are of a palish slate-grey next the skin, and tinted with brownish externally, and the ends of the hairs on the outer side of the thighs are slightly suffused with a purplish rust tint.

The female is much smaller than the male, and has the limbs less powerfully formed; its colour is much paler, being silvery-grey; on the back is a faint purplish-brown hue; the abdomen is nearly white; the cheeks are greyish-white; on the chin is a dusky patch; the tail is dirty white, slightly tinted with brownish on the upper side; the legs paler than the body; the fore feet brown, but with the toes nearly black; the hind feet are pale, and the toes are brown-black.

	Male.		Female.	
	In.	Lines.	In.	Lines.
Length from tip of nose to root of tail	49	6	40	0
" of tail	34	6	30	0
" from nose to ear	8	0	7	0
" of ear	3	7	3	0
" of fore arm, hands, and claws	13	6	10	6
" of tarsus and toes, including the nails	12	0	10	2

Mr. Gould first described this animal as a member of the

section *Petrogale*, but he is now of opinion that it is very nearly related to the *M. antilopinus*, an opinion in which I agree. In the general form of the skull, *M. robustus* approaches the *M. giganteus*, and in those parts in which it deviates from the skull of the animal just mentioned, we can perceive strong indications of affinity to the *M. antilopinus*. The close relationship of the present animal to the one last mentioned is also displayed in the structure of the muffle, the large size and great power of the fore-legs, and the structure of the tarsi. As compared with the skull of *M. giganteus*, that of *M. robustus* differs in having the muzzle broader and the zygomatic arch deeper. The sagittal crest is well marked. The incisor teeth scarcely differ from those of *M. antilopinus*; the external grooves on the posterior incisor are indistinct, but the two can be traced, and they occupy the same position as in the incisor of the animal just mentioned. The skull differs from that of *M. antilopinus* in being more elongated, in having the muzzle narrower, and broadest behind; the frontal bones are less concave between the orbits. The palate is almost destitute of posterior palatine openings.—These notes are drawn up from a skull in Mr. Gould's collection, which furnishes the following dimensions :—

	Inches.	Lines.
Length of skull	7	7
Width	3	10
" of interorbital space	1	2
Length of nasal bones	3	2
Width of ditto at the base	1	3½
" " near the apex	0	10
Depth of zygomatic arch behind	1	1½
Length of palate	4	7
" of three upper incisors	0	9½
—of which the posterior incisor is	0	4½
Distance between incisors and molars ...	1	6½
Length of the five molar teeth taken together	2	2
Length of lower jaw	5	4½
Height from apex of coronoid process	3	1

MACROPUS (*Halmaturus*) RUFUS. Red Kangaroo.

Kangurus rufus. Desmarest, Mammalogie, Supplément, p. 541, 1822.
" *laniger.* Gaimard, Bulletin des Sciences par la Société Philomatique, Année 1822, p. 138.
" " Quoy et Gaimard, Voyage de l'Uranie, p. 65, Plate 9, 1824.
Macropus laniger. Gould, Monogr. Plate 2, Partt 1.

Male.—Fur short, moderately soft to the touch, and of a woolly, or rather, cotton-like texture: prevailing hue bright, but rather pale, rust colour; head greyish at the sides; chin and region of the mouth white, with a few small black spots, and one larger patch of the same colour above the angle of the mouth; cheeks with an indistinct whitish mark; ears rather large, white internally, externally greyish, but with some black hairs at the tip; limbs and tail nearly white; toes blackish, both large and powerful.

Female.—Limbs more slender; the fore legs considerably smaller in proportion: prevailing hue palish-grey, with an obscure vinous tint, and in parts, especially about the loins and haunches, of a bright, but rather pale rust colour; a distinct broad white mark on the cheeks.

Of this, which is one of the largest and most beautiful of the Kangaroo tribe, the National Collection contains four specimens, exhibiting the differences of sex and age; these were brought home by Mr. Gould, by whom the species is most beautifully figured in the first part of his Monograph of this interesting group. Until the arrival of these specimens in England, a single individual only existed in the European museums—that contained in the collection at Paris, which was procured during M. Freycinet's Voyage of the Urania, having been presented to the officers of that expedition by Mr. Fraser, the botanist, during their stay at Sydney, and was said to have been procured at Port

Macquarrie. This specimen is in bad condition, and Mr. Gould informs us, that the defective parts of its fur have been made up by finely-cut sheep's wool; whence has arisen, he supposes, the specific name *laniger*, most commonly used for the animal. This name, however, is not altogether inapplicable to the species, for its natural fur is of a somewhat woolly nature; or it might, perhaps, be more justly compared to a coarse kind of cotton, and the softness of texture arises from an almost total absence of the longer and coarser hairs, which in most Kangaroos hide the soft and dense under fur—a character which at once catches the eye, and assists in distinguishing it from its congeners. M. Desmarest's specific name of *rufus*, however, has the priority of that of *laniger* (Gaimard), and hence should be used in preference. Mr. Gould procured two of his specimens in South Australia, and the others on the plains bordering the Namoi. "From the works of Oxley and Sturt," Mr. Gould remarks, "we find that this species frequents the banks of the Murrumbidgee and Darling; we may consequently infer that it is very generally dispersed over the great basin of the interior of Australia, and it certainly is over the eastern portions of that continent. * * * The female is particularly attractive, from her graceful, slender, and elegant form, and from the snowy whiteness of her legs, and of the under part of the body, contrasted with the blue-grey tint of her sides and back. The male, especially when adult, has the red and white more blended into each other, the blue-grey, which distinguishes the female, being rarely, if ever, perceptible; hence has arisen the names of *red buck* and *blue doe* for the two sexes repectively: the female is also called the *flying doe*, from her extreme fleetness, for which her whole structure is so admirably adapted, that I have little hesitation in saying, that, under favourable circumstances, she would outstrip the fastest dogs: occasionally, however, both sexes are successfully chased, either from the chase being over soft muddy soil, or, in the case of the female,

from her being encumbered by a large and heavy young one, which she has not been able to disengage from her pouch, and which she will always do, if possible, when hardly pressed." Two of Mr. Gould's specimens, male and female, were each procured by *a single dog; the former* was held at bay until the party came up and dispatched him, but not before he had made a fearful resistance.

The Red, and the Great Grey Kangaroo, sometimes inhabit the same districts; still, Mr. Gould states, they more commonly frequent localities of a different description; the latter resorting to grassy valleys, and brush growing on the dark soil, whilst the former apparently prefers the hard red stony ridges, clothed with box, and open plains, in the midst of which it may frequently be seen basking in the sun. The large male, which Mr. Gould estimated as having a weight of above 200 lbs., was killed whilst he and his party were making a forced march, between the Murray and Adelaide, at a time when all their provisions were exhausted; and its flesh, which is said to be excellent, lasted them four days. The dimensions of an adult male and female, in the British Museum, are as follows:—

	Male. In.	Male. Lines.	Female. In.	Female. Lines.
Length from tip of nose to root of tail (measuring over the curve of the back) ...	60	0	44	0
" of tail	38	0	2	9
" of hind foot and claws	14	6	12	0
" of fore leg to end of claws	17	0	12	0
" from ear to tip of muzzle	7	9	6	6
" of ear	5	0	5	0

	Female.		Male?	
Total length of skull	6	6	?	
" width	3	$4\frac{1}{2}$	?	
Length from the orbit to the tip of the intermaxillary bones	3	3	3	7
Length of nasal bones	2	8	3	2
Width of ditto at the base	0	$9\frac{1}{2}$	1	2
" of ditto near the apex, immediately behind the free points	0	$6\frac{3}{8}$	0	$7\frac{3}{4}$
" between the orbts	1	1	1	5

	Male. In.	Male. Lines.	Female. In.	Female. Lines.
Length of palate	3	10	4	3
Greatest width of ditto between molar teeth ...	1	$0\frac{1}{2}$		
Length of five molar teeth taken together ...	2	1		
" of three last molars taken together ...	1	6	1	$5\frac{1}{4}$
" of three incisors taken together ...	0	$8\frac{1}{8}$	0	$7\frac{1}{2}$
Width of the posterior incisor	0	$3\frac{1}{2}$	0	$2\frac{3}{4}$
Distance between incisor and molar teeth ...	1	7		
Width of muzzle in the middle	1	3	1	5

The dimensions in the first column are from a skull in the British Museum, which, compared with that of *Macropus giganteus*, does not differ much in its proportions; the zygomatic arch is thrown rather less boldly outwards; the interorbital space is narrower, and this part, which encloses the turbinated bones, is less inflated; the posterior upper surface of the frontals is more concave, and the outer surface of the lachrymal bone is much larger. The incisor teeth are considerably smaller; the foremost incisor is broader than the second, and is indeed but little narrower than the third, which has but one shallow vertical groove, situated rather in front of the middle—see Plate 5, fig. 3. The fifth, or hindermost molar, had penetrated the gum in this skull, but had not yet come into use; it exists with the other four molars, but the foremost of them is partially absorbed at the root, and no doubt would shortly have been cast. In the second cólumn are some dimensions taken from an imperfect skull, but evidently belonging to an old individual of *M. rufus*. Upon comparing this skull with one of *M. giganteus*, of about equal size, I noticed, among other differences, that the nasal bones were longer, broader at the base, and narrower at the opposite extremity, and the space between the molars and incisors was distinctly less. The palate is without perforations, or with very small openings only, as in *M. giganteus*. The lower jaw differed from that of *M. giganteus* very considerably in the height of the ascending ramus. The

height of the jaw, in a line dropped vertically from the apex of the coronoid process, was 3 inches 2 lines in *M. giganteus*, and but 2 inches 5 lines in *M. rufus*. The fore legs in *M. rufus* are much longer and more powerful than *M. giganteus*; the tarsus is long, but the great central toe is shorter in proportion than in the animal last mentioned. The hinder part of the muffle is clothed with hairs, and these terminate so as to form a point in front, which is situated about in a line with the middle of the nostril openings; laterally the hairs extend to the posterior angles of the nostrils, which are also fringed with hairs internally.

MACROPUS (*Halmaturus*) AGILIS. The Agile Kangaroo.

Halmaturus agilis. GOULD, Proceedings of the Zool. Soc. for October, 1842, Pt. 9, p. 81. Monogr. Pt. 2. Pl. 5.
" " HAMBRON ET JACQUINOT, Voyage au Pole Sud. Pl. 19.
" *Binoe.* GOULD, Proceedings of the Zool. Soc. for May, 1842, Pt. 10, p. 58.

Fur short, harsh, and closely applied to the body; general colour sandy or brownish yellow; on the back pencilled with black; under parts nearly white; feet brownish white; tail long, clothed with small adpressed whitish hairs; on the mesial part of the upper surface yellowish, but near, and at the apex, the hairs are dusky; a whitish mark crosses the haunches.

Inhabits North Australia.

The Agile Kangaroo, it would appear, extends along the whole of the north coast of Australia, specimens having been sent to Mr. Gould from Cobourg Peninsula, Port Essington, Raffles Bay, and from the shores of Torres Straits. " It is stated to be a most agile species, readily eluding the dogs employed in hunting it, by its extreme activity in leaping

over the high grass; when chased, it frequently seeks shelter in the thick beds of mangroves, passing over the muddy flats in such a manner as almost to baffle pursuit."[1]

In very many quadrupeds, the clothing consists of hairs of two kinds; the one which composes what I have termed the under fur, is very soft, often woolly, and generally more or less hidden by longer interspersed hairs, which are of a harsher nature, and which may be said to constitute an upper or outer fur. Sometimes the longer hairs assume the form of bristles, and even spines, (indeed all the different stages may be seen in the different species of *Echimys*, or spiny rats of South America, as well as in the Old World Rats.) In cases where the longer hair assumes the form of spines, the under fur is *generally* but little developed, and this under fur is almost always abundant in Mammals inhabiting cold climates, and in those which live on the summits of lofty mountains. It is generally abundant also in nocturnal species, and those which inhabit damp and swampy situations, or that live in the water, even though they are denizens of a hot climate. On the other hand, the upper fur is often much developed in quadrupeds living in tropical climates: in the former cases the under fur is to protect the body from cold or wet, and in the latter, the long hair would appear to serve as a protection from the heat. Finally, I may remark, that the same animal exhibits great changes in the character of its fur when transported to different climates.

Having observed that the character of the fur varies with the climate, we are prepared to find Kangaroos, which, like the present species, or the *M. antilopinus*, inhabit the most tropical portions of Australia, with the fur composed almost entirely of the coarser kind of hairs,—the under fur being very little developed. In these two species the fur is short,

[1] Gould's Monograph.

and in the *M. antilopinus* it resembles that of the tropical antelopes, but in the Tree Kangaroos of New Guinea, (*Dendrolagus*), the outer fur is long, and may be compared to that of the monkeys.

The present species would appear to occupy an intermediate station between the true Kangaroos and the Wallaby Kangaroos (Halmaturi), the hair extending on to the muffle more than in the typical Halmaturi, being produced so far forwards as to be in a line rather below the centre of the nostril openings: there is, however, a naked space on each side next the openings in question of about 1½ lines in width: the part covered with hair is gradually diminished in width towards the front, where it has a small angular emargination, or encroachment of the naked part.

The prevailing colour of the fur in *M. agilis* is sandy-yellow, but the back is somewhat pencilled with black, the hairs, many of them, being tipped with that colour,—below the point they are very nearly uniform to the root, being but indistinctly tinted with ashy-grey next the skin; the greyish tint is followed by a yellowish hue, which becomes paler as it approaches the point of the hair. On the under parts, the hairs are white, but slightly tinted with yellowish, and this latter tint is most evident on the abdomen, on the sides of which they are distinctly yellowish below the point, which is white; in some parts they are slightly suffused with pale grey at the root. The head has a whitish yellow patch above each eye; the muzzle is somewhat tinted with brownish; the crown of the head is also brownish, and this tint is extended backwards on to the neck; on each side of the occiput, behind the ears, is a whitish patch; the hairs on the occiput are directed forwards, and meet those of the head, which have the usual direction, in a line with the front margin of the ears. The ears are clothed with yellowish hairs externally, but are black at the apex, and along the anterior

margin; on the inner side the hairs are white: a whitish mark crosses the haunches, running backwards from the knee, where it is most distinct. The fore legs are rather large, and the fore feet are also large, and armed with long and powerful claws; both fore and hind feet are of a brownish-white colour; the latter are of moderate size. The tail is long, rather slender, and clothed with short adpressed hairs,—it is chiefly white, but suffused with yellowish above at the base, and a mark of the same colour may be traced (though not very distinct) along the whole upper surface, excepting about two or three inches at the apex, where the hairs are a trifle longer and of a dusky brown colour.

	Inches.	Lines.
Length from the tip of the nose to the root of the tail	36	0
" of tail	34	6
" of tarsus	10	3
" from nose to ear	5	7
" of ear	2	7
" of arm and hand, including the nails, about ..	10	0

A skull of *Macropus agilis* now before me, as viewed from above, could scarcely be distinguished from one of *M. Bennettii;* the size and proportions are nearly the same; the facial portion of the cranium of *M. agilis*, however, is longer and a trifle narrower; the nasal bones are longer, broader, and less contracted in the middle than in *M. Bennettii:* viewed from beneath there is likewise but little difference, excepting in the size of the posterior palatal openings, these being very large in *M. agilis*, (*i. e.* nearly 9 lines in length), and small in *M. Bennettii*, where they are not more than 3 lines long. In the teeth of the two animals there are evident differences, both the molar and incisor teeth in *M. agilis* being larger. The skull is not that of an adult animal, having the fifth or hindermost molar tooth still in the socket; the four which are developed measure 1 inch 5¼ lines in length, whilst in

M. Bennettii, the corresponding teeth, taken together in the same manner, measure 1 inch $3\frac{1}{4}$ lines: other differences will be perceived upon comparing the following dimensions with those of the skull of *M. Bennettii*.

	Inches.	Lines.
Total length of skull	5	6
" width	3	0
Length of nasal bones, rather more than[1]	2	3
Width of ditto at the base	0	10
" at the apex, immediately behind the contracted free points	0	$6\frac{1}{2}$
Length of palate	3	$4\frac{1}{2}$
Width of ditto opposite the third molar tooth ...	1	$0\frac{1}{2}$
Length of the anterior four molar teeth taken together	1	$5\frac{1}{4}$
" of the three incisors together	0	9
Distance between incisors and molars	1	$3\frac{1}{2}$
Length of hindermost incisor	0	$4\frac{2}{3}$

The hindermost incisor tooth of the upper jaw, which is considerably broader than the corresponding tooth in *M. Bennettii*, has a distinct external vertical fold situated rather in front of the middle of the tooth (see Plate 5, fig. 13). The foremost molar is broad, viewed externally, and presents two vertical narrow ridges on its outer side.

The lower jaw indicates more strength of the masticating muscles than in *Bennettii*, and this is likewise made evident by there being a distinct sagittal crest to the cranium, whilst in the older skull of *Bennettii*, the ridges formed by the temporal muscles are separated and less developed. The height of the jaw, measuring from the tip of the coronoid process, is 2 inches $3\frac{1}{4}$ lines; in *Bennettii* 2 inches $0\frac{1}{4}$ lines. The incisor teeth are broader and rather shorter than in the last mentioned animal.—From specimens in the British Museum collection.

Mr. Gould describes a small Kangaroo from Port Essington,

[1] Their apices are broken off.

North Australia, which so perfectly resembles his *Halm. agilis* in all respects excepting size, that I cannot regard it as a distinct species: it is the

Halmaturus Binoe.

In size, this animal nearly agrees with the *Halm. Derbianus*, its dimensions being as follows:—

	Inches.	Lines.
Length from nose to base of tail	21	0
" of tail	20	0
" of tarsi	8	0
" of ears	2	3
" of hands and claws	2	4

MACROPUS (*Halmaturus*) PARRYI.

Parry's Kangaroo.

Macropus Parryi.	BENNETT, Proceedings of the Zool. Soc. for December 1834, p. 151; Trans. of the Zool. Soc. vol. i. p. 295, Pl. 37.
Macropus (Halmaturus) Parryi.	WATERH. Plate 18, and p. 206 of Vol. on Marsupialia in Naturalists' Library.
Halmaturus Parryi.	GOULD, Monogr. Part 2.

Silvery grey above, white beneath; upper surface of muzzle sooty black, but becoming paler and brownish on the posterior part; a distinct white line on the cheeks; fore and hind feet with the toes black; the tarsus and fore part of hind leg white; tail very long, and somewhat compressed, grey white, with the apex black: height about two feet six inches.

Inhabits New South Wales.

A delicately coloured species, and at the same time one of the most elegantly formed of the Kangaroo tribe. The specimen from which Mr. Bennett drew up his account, and from which the present description is taken, was brought alive to this country, and presented to the Zoological Society, by

Captain Sir Edward W. Parry, R.N., who states that it was procured at Stroud, near Port Stephens, in the latitude of about 30° south. It was caught by the natives, by whom it is called *Wŏllăroo*, having been thrown out of its mother's pouch when the latter was hunted. At that time it was somewhat less than a rabbit; but, having continued in the possession of Sir Edward Parry for more than two years in New South Wales, besides six months on the passage home, it was no doubt full grown when it reached England. It was never kept in confinement until it was embarked for England, but lived in the kitchen, and ran about the house and grounds like a dog, going out every night after dark into the "bush" to feed, and usually returning about two o'clock in the morning to its friend, the man cook, in whose bed it slept. Besides what it might obtain in these excursions, it ate meat, bread, vegetables—in short, every thing given to it by the cook, with whom it was extremely tame; but it would allow nobody else to take liberties with it. It expressed its anger, when very closely approached by others, by a sort of half-grunting, half-hissing, very discordant sound, which appeared to come from the throat, and was not accompanied by any alteration in the expression of the countenance. In the day-time it would occasionally, but not often, venture out to a considerable distance from home, in which case it would sometimes be chased back by strange dogs, especially those belonging to the natives. From these, however, it had no difficulty in escaping, through its extreme swiftness; and it was curious to see it bounding up a hill and over the garden fence, until it had placed itself under the protection of the dogs belonging to the house, especially two of the Newfoundland breed, to which it was attached, and which never failed to afford it their assistance by sallying forth in pursuit of its adversaries.

A second specimen was presented to the Zoological Society

by James Macarthur, Esq., and lived in the menagerie for a short time.

Parry's Kangaroo is of a more slender form than most of the Halmaturi, and has a remarkably long tail. The ears are moderately large; the fur moderately long, and not very soft to the touch; on the upper parts of the body it is of a silvery-grey tint, but with a delicate brownish hue in parts, especially on the hinder portion of the back: the hairs on the under parts of the body, and inner side of the limbs, are of a pure white colour to the root, but those on the chest are slightly tinted with greyish at the point. The sooty brown colour of the upper surface of the muzzle is separated from a grey tint which prevails on the lower and hinder parts of the cheeks, by a distinct white band running from the upper lip backwards, and terminating nearly in a line with the hinder portion of the eye. The back of the head is also white, and so is the fore arm; but this latter is faintly tinted with grey externally. The ears have white hairs on the inner and outer surfaces; but they are dusky at the point externally, and clothed with long sooty black hairs at the base. The tail is furnished with short harsh hairs, which are nearly white on the upper surface, being but slightly tinted with grey; about six inches of the under surface of the apical portion, however, is covered with long black hairs, which form a kind of fringe; the tip of the tail is also black above.

	Inches.	Lines.
Length from tip of the nose to the root of the tail	34	0
" of tail	31	0
" from nose to ear	5	4
" of tarsus	9	6
" of ear	3	7
" of fore-arm and feet, claws included ...	8	4

Mr. Lambert notices a species of Kangaroo, in the Linnæan Transactions (Vol. VIII. p. 381, Plate 16,) under the name

Macropus elegans; but his description is so short that it will always be a matter of doubt as to the species to which his name should be attached. That it is of a silvery grey colour, and has the following dimensions, is all that we can glean from his account :—

	Inches.
Length from tip of nose to end of tail	$62\frac{7}{10}$
" " to eye	$2\frac{8}{10}$
" " to back part of skull ...	$5\frac{7}{10}$
" of tail	$26\frac{8}{10}$
" of ears	$3\frac{8}{10}$
" of hind leg, from the claws to the " knee," (by which the *heel* is no doubt meant) . ..	10

These dimensions, combined with a silvery grey colour, are more applicable to the *Macropus Parryi* than to any other known species; and I find Mr. Gould agrees with an opinion I formerly expressed, that the *elegans* of Lambert was specifically identical with Parry's Kangaroo. Mr. Gray, however, associates *Lambert's* account with a very differently coloured animal, the *M. ruficollis*, and has been led to do so from an inspection of a coloured plate in a copy of the Linnæan Transactions, which formerly belonged to Sir Joseph Banks, and which is now in the British Museum Library. This plate represents the animal as of a very pale grey colour, with the under parts of the body, and apical half of the tail, white, the crown of the head, hands, and fore half of the foot dusky, or blackish; there is no trace of red on the neck or elsewhere. I think it must be intended to represent the *Macropus Parryi.*

The skull of *M. Parryi* greatly resembles that of *M. Bennettii*, but may be distinguished by the facial portion being more produced, the nasal bones longer, and less contracted in the middle, the sides being nearly parallel. The upper incisor teeth are *very* nearly the same; the groove in

the hindermost of these teeth is in the middle. The foremost molar tooth, or premolar, is distinctly smaller in proportion, being 2$\frac{3}{4}$ lines in length, whilst, in *M. Bennettii*, it varies from 3$\frac{1}{2}$ to 3$\frac{2}{3}$ lines: in this respect *M. Parryi* shows a nearer approximation to the typical Kangaroos, where this tooth is very small: on the other hand, we find the same tooth in *M. Ualabatus* still larger than in *M. Bennettii*; and it is most developed (combined with the normal Macropus structure of true molars) in the *M. Brunii* and the extinct *M. Atlas*.

	Inches.	Lines.
Length of skull	5	3
Width of ditto	2	10$\frac{1}{4}$
" between orbits	1	0
Length of nasal bones	2	1
Width of ditto at the base	0	9$\frac{2}{8}$
" near the apex	0	0
Length of palate	3	2
" of posterior palatine openings	0	6$\frac{1}{4}$
Depth of zygomatic arch behind	0	8$\frac{1}{8}$
Length of the five upper molar teeth taken together	1	7
" of the three upper incisors taken together	0	7$\frac{1}{4}$
" of the posterior incisor	0	3$\frac{2}{8}$
Distance between the upper incisor teeth and the molars	1	5$\frac{3}{4}$
Length of foremost molar of the upper jaw ...	0	2$\frac{3}{4}$

MACROPUS (*Halmaturus*) IRMA.

The Black-gloved Kangaroo.

Halmaturus Irma. JOURDAN, Annales des Sciences Naturelles for December, 1837, Vol. 8, p. 371; Comptes Rendus des Séances de l'Acad. des Sciences for October 9, 1837, p. 523.

Macropus (*Halmaturus*) *manicatus*. GOULD, Proceedings of the Zoological Society for October 1840, p. 127.

Halmaturus manicatus (Black-gloved Wallaby). GOULD's Monogr. Part 1, 9th Plate.

Fur moderate; grey (distinctly pencilled with black and white), but exhibiting a yellowish cast, owing to the hairs being of

that tint below the exposed ends; under parts pale grey, slightly suffused with yellowish; upper surface of head and muzzle sooty brown, nearly black on occiput and back of ears, which have, however, yellowish hairs at the base; internally they are yellow, but margined with black at the apex; cheek-mark yellow-white; chin with a black spot; legs and feet yellow, excepting the fore half of the latter, which is black; tail long, grey, with the tip black, and having long black hairs (forming a kind of crest), both on the upper and under surface of the apical half, which is somewhat compressed.

Inhabits Western Australia.

I feel no doubt that the *Macropus Irma* and the *M. manicatus* are varieties of the same species; since, however, they differ in some respects, it is necessary to state that the above diagnosis is drawn up from Mr. Gould's original specimen of the *M. manicatus*, a very elegant and beautiful Kangaroo. Its fur is moderately long and moderately soft; the visible parts of the hairs on the back are black and white, each hair having a tolerably broad white ring below the black point; the middle portion is of a palish rusty yelow, and the basal portion, or root, grey; on the neck and sides of the body the black and white parts are less distinct, and the yellow is more evident; and this is still more the case on the under parts of the body; indeed, the lower part of the abdomen is almost entirely yellowish. The upper parts of the head and muzzle are sooty brown, and a faint rufous hue is just traceable on the crown of the head; the occiput is almost black, and a broad dusky band runs downwards from the occiput along the back of the neck; rather more than the apical half of the ear externally is covered almost entirely with sooty black hairs, and a broadish black band runs down the anterior margin; the remaining external portion is clothed with yellowish white hairs; internally the ears are provided with long yellow hairs, but at the apex they are distinctly margined with black; and this

hue descends about half an inch from the point of the ear. The legs, excepting at the base externally, and the feet, are ochreous yellow, the fore half of the latter excepted, which is black, and the black and yellow parts of the feet are separated by a well-defined line, as if the animal had thrust its feet into some black dye. The hairs covering the inner double toe of the hind foot are partly yellow and partly black. The tail is long, rather slender, and well clothed with adpressed hairs, which are partly black and partly white, in nearly equal proportions: on about the middle of the tail, both above and below, the hairs are considerably lengthened, and continue, in the form of a crest, to the apex, where they are fully an inch and a half in length: these crests, or fringes, are almost entirely black, but, at some distance from the point, some narrow white rings are visible on the hairs which form the upper crest, and these become more conspicuous as we proceed towards the middle of the tail: on the sides of the tail the hairs are adpressed, and but little longer at the tip than elsewhere; they are annulated with black and white almost in equal proportions, but a space of about an inch and a half from the tip of the tail is clothed with hairs which are almost totally black. The height of this animal, in its ordinary erect position, is about twenty-six inches.

	Inches.	Lines.
Length from tip of muzzle to the root of the tail	31	0
" of tail	27	0
" of tarsus and claws	8	10
" from nose to the ear	5	0
" of ear	3	6

The Black-gloved Kangaroo is said by Mr. Gilbert to be found equally abundant in all parts of the colony of Swan River, West Australia. It generally inhabits scrubby places,

though occasionally seen feeding upon the open plains, but it always takes to the scrub when hunted: it runs very fast.

M. Jourdan's account is as follows:—Form very elegant; the limbs very delicate; head above and upper parts of body grey; chin with a black spot; cheeks and lips yellowish white; outer side of ears with the fore part brown, and posteriorly white; inner side yellow; the apex black; between the ears is a brown spot, which is extended somewhat on to the neck; chest, neck, and flanks, as well as the outer side of the legs, yellow; wrist and tarsus also yellow; the fingers and toes black; tail grey, blackish near the tip, terminated with white hairs, and having a double crest of hairs, of which the longer is on the upper side.

	Inches.	Lines.
Length from nose to tail ...	28	5
" of tail	24	10
" of fore leg	4	4
" of hind leg	17	9
" of ear	3	2

Inhabits the Swan River district.

Two Kangaroos in the British Museum collection agree so closely with M. Jourdan's description as to leave no doubt as to their specific identity with the *H. Irma*, and I am thus enabled to make a comparison between the animals named *Irma* and *Manicatus*, and to notice certain differences which, I repeat, I do not regard as specific. In the first place, both these specimens (as well as the specimen noticed by M. Jourdan) are smaller than Mr. Gould's specimen of *H. manicatus;* their general colouring is paler, the black and white pencilling of the hairs on the upper parts of the body being less distinct, and the hairs on these parts are reddish, rather than yellow, in the middle, and pale grey at the root: the reddish hue, which is very pale and delicate, shows but little

on the upper part of the body, but is distinct on the neck and flanks; the under parts are grey-white, slightly suffused with reddish yellow; the upper lip is yellow, and the cheek-mark of a cream colour; the top of the head and muzzle are grey, and the crown of the head is slightly tinted with rust colour; the tip of the muzzle is sooty black, and so are the occiput and back of the ears, but the latter are brownish at the root, and have a large white patch behind at the base; on the inner side the ears are yellow, and at the apex they are broadly margined with black; the fore arm and foot, and the outer side of the hind legs and tarsi, are yellow, but the anterior half of the feet is black; the black of the latter, however, is pencilled with brownish, and in parts with white, excepting on the toes; the double inner toe is pencilled with yellow and black. The hairs of the tail are pencilled with black and white, and are shortish and adpressed, excepting on the dorsal line of the apical half, where they are long and chiefly black, and on the under side, where longish black hairs extend from the tip to within about six inches of the root; near the apex of the tail these long hairs assume a brownish hue, and at the tip is a large tuft of yellowish white, or white, hairs; this pencil, or tuft, of pale hairs is about two inches long.

	Inches.	Lines.
Length from nose to tail	27	0
" of tail	22	0
" from nose to ear	4	4
" of ear	3	0
" of tarsus	8	3

The specimen furnishing the above characters is a male; the second specimen is a female, and differs only in being rather smaller, and in having the back of the ears brownish, and grey at the base; they have the same white posterior patch.

A skull of *M. manicatus*, for the loan of which I am indebted to Mr. Gould, presents the following dimensions :—

	Male*. Inches.	Lines.
Total length	4	$4\frac{1}{2}$
Width	2	$3\frac{2}{3}$
" of interorbital space	0	$9\frac{1}{3}$
Length of nasal bones	1	$10\frac{1}{2}$
Width of ditto at the base	0	8
Width of nasal bones near the apex ...	0	$4\frac{2}{3}$
Length of posterior palatine openings ...	0	2
" of three upper incisors	0	6
" of the upper premolar	0	$2\frac{1}{2}$
" of lower jaw	2	$11\frac{1}{2}$
Height of ditto from apex of coronoid process	0	7

The foremost incisor tooth is very broad, being equal in width to the third; the second is much narrower; the third has a deep vertical groove very near the middle of the outer surface.

MACROPUS (*Halmaturus*) GREYI.

Grey's Kangaroo.

Halmaturus Greyii. Gray, List of the Mamm. in the British Museum, (1843), p. 90.

Fur moderate; general colour pale ashy-brown, slightly tinted with yellowish; under parts of the body, as well as the legs and feet, of a pale buff yellow; toes black; chest greyish; head grey, with a broad blackish mark on the cheek, extending from the angle of the mouth to the eye; a broad yellowish mark below this, and beneath this again is a brownish band: extreme tip of the upper surface of muzzle black; crown of head very faintly tinted with rufous, and the back of the neck (if we except a dusky dorsal streak), and the ears externally, also pale rufous; the apical portion of the ear, however, is black; on the inner side of the ear the hairs are yellow, but at the apex they are black. Tail

* Not quite adult.

well clothed with hairs (rather longer, softer, and less adpressed than usual) of a very pale grey colour, washed, as it were, with yellow on the upper parts, and brown-white beneath; a considerable space at the apex covered with long dirty yellowish hairs.

Inhabits South Australia.

Two specimens of this beautiful species have recently been presented to the British Museum by the Hon. Capt. G. Grey, in honour of whom it has been named.

This species is allied to the *Halmaturus manicatus* of Gould, but differs not only in colouring, the general tint of the upper parts of the body being brownish, but pale and with an admixture of yellow, whilst in *H. manicatus*, or *Irma*, it is grey, but may be distinguished from either of the two animals mentioned by its having no crests to the apical portion of the tail: this organ is clothed at the sides, as well as on the upper and under surfaces, with long pale hairs at the apex. The palish tint of the upper parts of the body is produced by the mixture of white with pale rust colour and black, the visible portion of each hair exhibiting these colours; the hairs are, in fact, of a very pale grey at the root, rusty yellow in the middle, and this is followed by a white space, and the remaining portion is black, but between the white space and the black point is a narrow ring of a rusty-red colour. On the under parts of the body the hairs are of a pale buff-yellow colour externally, and pale-grey at the root. The head is grey above, obscurely tinted with rufous, and this latter tint is also observable on the back of the ears, as well as on the neck: immediately behind the naked tip, the muzzle is dusky black above, but the black hue is almost immediately blended into the general grey tint: on the sides of the muzzle are three longitudinal bands, of which the middle one, representing the ordinary pale cheek-mark, is pale yellow; the upper one almost black, but slightly

pencilled with whitish, and the lower one is somewhat suffused with brownish: the ears are well clothed internally with rich yellow hairs, but they are rather narrowly margined with black at the apex; externally, the black extends downwards from the point for about half an inch: behind the eye is a yellowish spot. The chin and throat are tinted with fulvous, and there is a greyish spot on the former; the chest is greyish; below the chest the fur has a pale rusty-grey hue. The fore legs are grey-white at the base, and of a very pale fulvous colour, or fulvous-white beyond, and the hands are of the same colour, but the fingers are black, and the black extends very slightly beyond the base of the fingers; the hind legs and feet are coloured in the same manner: the thighs are somewhat greyish externally at the base, and the toes are black, if we except the long hairs which cover the nails, these being brownish. The tail is densely clothed with longish hairs, which on the upper surface are softer, and not closely applied to the skin, as is often the case in the Kangaroos; they average at about three-quarters of an inch in length, but are about an inch and a half long on the apical portion of the tail; here they are dirty yellowish white, which colour extends about four inches from the tip; on other parts they are of a pale greyish tint, suffused with yellow; on the under side the hairs are still long, but harsh and adpressed. The foremost incisor tooth of the upper jaw is distinctly the broadest; the middle incisor on either side is the smallest, and has a faint vertical groove; in the hindermost the vertical groove is distinct: the length of the three together is 6½ lines.

	Inches.	Lines.
Length from tip of nose to root of tail ...	30	0
" of tail	26	0
" of tarsus and nails	9	9
(of which the nail of the central toe, is	1	6)

	Inches.	Lines.
Length of ear	2	11
" from nose to ear	5	2
" of fore leg to the ends of claws of fingers	6	7

MACROPUS (*Halmaturus*) RUFICOLLIS.

The Red-necked Kangaroo.

Kangurus ruficollis. DESMAREST, Nouv. Dict. d'Hist. Nat. tom. xvii. p. 37, 1817: Mammalogie, p. 274.
Kanguroo à cou roux. F. CUVIER, Dict. des Sci. Nat. tom. xxiv. p. 348, 1822.
Macropus ruficollis. LESSON, Manuel de Mammal. p. 228, 1827.
Halmaturus elegans. (LAMBERT) GRAY, Catalogue of the Mammalia in the British Museum, (1843), p. 89.
" *ruficollis.* GOULD, Monogr. of the Macropodidæ, Part 2, Plate 2.
Kangurus rufogriseus. DESMAREST, Nouv. Dict. d'Hist. Nat. t. xvii. p. 36.
Halmaturus griseo-rufus. GOLDFUSS, in Isis, 1819, p. 267.
" *leptonyx.* WAGNER?

Fur moderate; general colour rusty grey—chiefly grey on the back, and chiefly pale rust colour on the neck, shoulders, and in the region of the eye; under parts grey-white, slightly suffused with pale rust colour; ears white internally, but with the apical margin black; externally blackish: fore feet brown or blackish, finely pencilled with white; the toes dark brown or blackish: tarsi dark brown, but with the mesial portion nearly white: tail grey-white, slightly suffused with black at the apex.

Inhabits New South Wales, and King's Island.

The Red-necked Kangaroo was discovered by MM. Péron and Lesueur, in King's Island, (one of the largest of the Islands in Bass's Straits), in which they also found the Wombat, Echidna, and a species of Dasyurus (*D. maculatus*). These two travellers, together with M. Leschenault, were left

by their party on King's Island in order to explore its productions, and their vessel not returning so soon as expected, all their provisions became exhausted, and they would have perished with hunger had they not fortunately met with a party of Englishmen who had settled there for the purpose of procuring the seals which abound on the shores of the small islands in Bass's Straits. From these settlers they received both food and shelter, until the vessel arrived, and M. Péron speaks in high terms of their kindness and rude hospitality. He found these seal fishermen living almost entirely upon the flesh of the Red-necked Kangaroo, Wombat, and Emu The Wombat was readily captured, owing to its sluggish habits, but to procure the swift Kangaroos and Emus, the settlers had trained dogs to go out by themselves and hunt, and it is said they seldom returned without success. Having killed a Kangaroo, the dogs abandoned their prey, and going to their masters, made them aware of the circumstance: one of the men was then dispatched to bring home the game, to which he was guided by the dogs.

M. Péron observes that his party subsequently obtained a dog similarly trained, and that, in Kangaroo Island, they procured by its assistance twenty-seven of the largest-sized Kangaroos in a few days.

The specimens of *Macropus ruficollis*, in the British Museum, are from New South Wales, and we are informed by Mr. Gould that this animal was formerly common near Sydney, but is now gradually retiring before the advance of civilized man; it is still, however, abundant in the thick *Daveysia* scrub on the table-land behind Illawarra, particularly on the fine estate at Bong Bong, belonging to Charles Throsby, Esq.

If the *M. Bennettii* be specifically identical with the *M. ruficollis*, (and I feel no doubt that it is) then must we add Van Diemen's Land to the habitats above given.

The fur of the *Macropus ruficollis* is moderate both as to length and texture, and its general hue is pale rufous grey: on the back, each hair is brownish grey at the root, and this tint is followed by pale rust colour, then a broad white ring, and the point is dusky; the region of the eye, the neck, shoulders, and fore legs, are chiefly of a pale rust colour, but pencilled with white: the under parts of the animal are whitish, but slightly suffused with pale rusty grey, the hairs on these parts being of a vinous-grey tint next the skin, slightly tinted with pale rust colour in the middle, and white at the point. The head is of the same general colour as the body, but on the crown it is somewhat dusky, and the muzzle is brownish; the upper lip is white, and there is a tolerably distinct whitish cheek-mark: on the chin is a brown patch. The ears are clothed with white hairs internally, excepting at the apical margin, where they are black, or nearly so; and on the outer side they are covered with brownish-black hairs at the apex, and with hairs like those of the head at the base. The fore legs are of a pale rust colour, but very much pencilled with white; the fore feet are brown, finely freckled with white, and the toes are dark brown. The hind legs are almost entirely of a pale rufous tint externally; the tarsi brown, but whitish in the middle: here the hairs, however, are dark brown at the root: the toes are dark brown, if we except the hairs covering the base of the nails, which are pale: on the fore part of the hind leg is a whitish mark running up from the tarsus. The tail is tolerably well clothed with hairs, which are partly white, and partly black; the general hue is nevertheless very pale, and may be described as grey-white; the apical portion is suffused with black.

The above description is from a male specimen in the Paris Museum, procured during Péron's expedition, and

which is moreover the original of Desmarest's description. A second specimen in the same collection is said to be from New Holland.

In the British Museum are specimens of the same species, procured by Mr. Gould from New South Wales; they are labelled *Halmaturus elegans*.[1]

The admeasurements of these specimens are as follows:—

	MALE. Original Specimen.		MALE. Second Specimen in Paris Mus.		MALE. Brit. Mus.		FEMALE. Brit. Mus.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of the nose to the root of the tail .	39	0	41	6	41	0	35	6
" of the tail	25	0	25	6	31	0	26	6
" of the tarsus and nails .	9	1	8	10	10	0	9	6
" *of which the nail of the central toe is* .	1	1						
" *from nose to ear* . .	5	6	6	0	6	0	5	3
" of ear	2	5	2	6	3	1	3	0
" of fore-arm, hands, and claws, about . .	9	3	9	6	10	6	8	0
" of the three upper incisors taken together	0	6¼			0	7		

Macropus (Halmaturus) Rufo-Griseus.

"M. Geoffroy distinguishes under this name, as belonging to a distinct species, a female Kangaroo of the Paris Museum, of a tolerably large size, since its length, measured from the tip of the muzzle to the base of the tail, is about 3 feet 10½ inches; the head 8¾ inches; the tail 2 feet 2 inches, and the ear

[1] Mr. Gray is of opinion that the *M. ruficollis* of Desmarest is specifically identical with the *Macropus elegans* of Lambert, briefly noticed in the "Linnæan Transactions," vol. viii. p. 381. The description given by Lambert, however, is more applicable to the *M. Parryi*.

nearly 4 inches and 4 lines: all the upper parts of the body are of a rusty grey colour, the grey, however, predominates, and the under parts differ only in being paler; the extremities of the feet and tail are shaded with brown, and the under side of the latter is of the same colour as the upper: the hairs on the back are rust coloured at the base, have then a whitish ring, and the point is brown; those of the belly and chest have the whitish portion less extended.

The *Macropus rufo-griseus* is vaguely indicated as inhabiting New Holland; its great size, however, leads us to suppose that it is the species referred to by the French travellers, MM. Péron and Lesueur, as inhabiting Kangaroo Island, where a second large species, supposed to be the *M. fuliginosus*, is also found."—From Desmarest, in the Nouveau Dictionnaire d'Histoire Naturelle.

Very recently, the author visited the Paris Museum with a view to examine and determine, if possible, the three species of Kangaroos described by Desmarest under the names *Kangurus ruficollis*, *K. rufo-griseus*, and *K. Eugenii*, but was disappointed to find that the originals of M. Desmarest's descriptions of the two last mentioned species no longer existed. An animal to which the specific name *rufo-griseus* is attached in the Paris Collection, certainly agrees very closely with Desmarest's description, excepting that its size is less than indicated by that author. This animal is a female, and is clearly of the same species as the specimens named *ruficollis* in the same collection. Its general tint is grey, much suffused with yellowish rust colour, and this last mentioned tint is almost uniform on the back of the neck, shoulders, and sides of the body: the under parts of the body are of an impure white; the fur on the back is much pencilled with white; the hairs are dusky at the point, greyish at the base, shaded into pale rusty-yellow near the middle, and white, or nearly white, towards the point: the tail is of a dirty greyish

white hue above, and dirty yellowish white beneath; the fore feet brownish, pencilled with white, and have the toes dark-brown; the tarsi are whitish in the middle, but the hairs on this part are brown at the base; the toes dark brown, with the exception of the hairs covering the nails, which are pale; the head is of the same general hue as the body, and, as in *M. ruficollis*, the region of the eye is tinted with pale rufous; the ears are clothed with white hairs internally, and are dusky externally; the fore part of the hind leg, immediately above the tarsus, is white.

	Inches.	Lines.
Length from the tip of the nose to the root of the tail	34	0
" of tail	22	6
" from nose to ear	5	0
" of ear	2	5
" of tarsus, including the nails	8	6
" of fore-arm, hands, and claws	8	0

The specimen from which the above description is taken is evidently very old, and may have been in the Paris Museum at the time that Desmarest drew up his description, but the difference of size, as I have before stated, forbids our believing it to be the *individual* described as *M. rufo-griseus*.

Macropus ruficollis, var. *Bennettii*.

Macropus Bennettii.	WATERHOUSE, Proceedings of the Zoological Society for October, 1837, Pt. 5, p. 103; Marsupialia, p. 211, Pl. 19.
Macropus (Halmaturus) fruticus.	OGILBY, Annals of Nat. Hist. for May, 1838, Vol. i. p. 219.
Halmaturus Ualabatus.	GRAY, Mag. of Nat. Hist. for Nov. 1837, Vol. i. (New Series), p. 583.
" *Bennettii.*	GOULD, Monogr. Pt. 1, 7th Plate.
" "	WAGNER, in Schreber's Saugeth. Suppl. 111—112 Heft, p. 115.

Fur long; moderate as to texture: general colour very deep grey, slightly tinted with rufous on the back of the ears at the base, and on the neck and shoulders; under parts grey-white; tail pale grey, black at the apex: the anterior half of the hind feet, the hands, and the apical half of the ear, externally, black: an indistinct whitish cheek mark: top of muzzle blackish.

Inhabits Van Diemen's Land.

That the *Macropus Bennettii* is a local variety only of the *M. ruficollis* I now feel little doubt; it differs, however, in having the fur longer, of a much darker general hue, being considerably suffused with black in parts, and exhibiting very little of the red tint which is so conspicuous in *M. ruficollis*.

The "Brush Kangaroo," as this animal is called by the colonists, is a native of Van Diemen's Land, where it is very abundant; "its flesh," Mr. Gould informs us, "is generally eaten, and highly esteemed, and its skin forms a considerable article of commerce, being largely imported from Van Diemen's Land into England for the manufacture of boots and shoes, besides being extensively used for the same purpose in the colony. It is universally dispersed over Van Diemen's Land, whose dense and humid forests afford it a retreat so secure as to preclude all chance of its extermination for centuries to come, although many thousands are killed annually. Advertisements may be frequently seen in Hobart Town newspapers, stating that three thousand skins are immediately wanted, and they are quickly supplied by the settlers, servants, and shepherds at the out-stations. They are either captured by dogs, or by snares set in their runs; the skins are generally taken off on the spot, and are afterwards stretched on the ground to dry; they are then sold for fourpence or sixpence each, to persons who visit the stock-stations of the interior for the purpose of collecting them, and who retail them again in Hobart Town, or Launceston, to the advertiser or others, for colonial consumption or for exportation."

Mr. Gould, moreover, states, that the Bennett's Kangaroo is gregarious in its habits, and although truly a brush animal, does not confine itself so strictly to localities of that description as the smaller species of the genus.

For many years past, specimens have lived and bred in the Gardens of the Zoological Society, as well as in the managerie of the Earl of Derby. In a large piece of enclosed ground in his Lordship's park, I had the pleasure of seeing many individuals of the Brush Kangaroo in a state of comparative freedom, and where they appeared to thrive well. When I entered the paddock in which they were kept, being all of them concealed amongst some heath, I was not aware of their presence until, approaching towards their place of shelter, they suddenly elevated the fore part of their bodies, and then darted off to a distant spot with great swiftness. When at rest they frequently assume a singular position; the fore feet are applied to the ground, and they at the same time sit upon their haunches, having the hind legs stretched forwards, and perfectly straight, as well as the tail, which lies between them. The young animal does not finally quit the pouch of the mother, until it has attained the size of a rabbit; at this time they do not differ in colouring from the parent. The female, as usual, is smaller and more delicately made than the male. The following is a description of an adult male and female which died in the menagerie of the Zoological Society.

The fur is long; that on the upper parts of the body is of a blackish grey colour next the skin, and black externally; but each hair is annulated with white or pale yellowish rust colour towards the tip. The general tint may be described as very dark grey, much pencilled with black, and less distinctly so with whitish on the back, but slightly washed, as it were, with pale rust colour; on the sides of the body the general hue is paler, the black being much less conspicuous;

and on back of the ears at the base, the back of the neck, the shoulders, the cheeks, and above the eye, a slight rusty hue prevails; the under parts of the body are grey-white, the hairs on these parts being grey, tipped with white. The top of the muzzle is blackish, and so are the ears externally, excepting at the base, the hands and wrists, and the fore half of the tarsus; internally, the ears are clothed with white hairs, but the apex is always more or less broadly margined with black: the chin is blackish; the upper and lower lips are margined with white, and there is a somewhat undefined whitish cheek-mark. The tail is clothed at the root with fur like that of the body, but beyond, the hairs are harsher and shorter, and the general colour is hoary grey, excepting on about five or six inches of the apical portion, where they are black; the under side of the tail is clothed with harsh, dirty white hairs, excepting at the apex, where they are chiefly black. On the posterior half of the tarsi, the hairs are hoary grey.

	Male. Inches.	Male. Lines.	Female. Inches.	Female. Lines.
Length from tip of nose to root of tail	35	0	30	3
" of tail	31	6	26	9
" from nose to ear	5	10	5	0
" of ear	2	11	2	11
" of tarsus	9	3	8	2
" from elbow to base of claws, about	9	3	7	0

	Sex unknown.			
Total length of skull	4	11½	5	6
Width	2	6½	2	11¼
" between orbits	0	10½	0	11⅓
Length of nasal bones	1	9½	2	0
Width of ditto behind	0	9⅓	0	9½
" of ditto near the apex ...				
Length of palate	2	11½	3	3
" of posterior palatal openings	0	4½	0	4¼
" of the five molars of the upper jaw, taken together ...	1	5½	1	7⅛
" of foremost molar, upper jaw	0	3½	0	3⅔

	Inches.	Lines.	Inches.	Lines.
Length of the three upper incisors, taken together	0	$7\frac{1}{2}$	0	8
" of the hindermost incisor ...	0	$3\frac{1}{2}$	0	4
Depth of the zygomatic arch behind ...	0	7	0	8
Distance between upper incisors and the molar teeth	1	$3\frac{3}{4}$	1	$3\frac{3}{8}$
Height of the lower jaw, measured in a vertical line dropped from the apex of the coronoid process	1	10	2	1

The upper incisor teeth are represented on Plate 5, fig. 9.

Macropus (Halmaturus) leptonyx.

Halmaturus leptonyx. A. WAGNER, in Schreber's Säugeth. Suppl. 111-112, Heft. p. 116, November 30, 1842.

Upper parts of the body variegated with brown and whitish; under parts whitish; the nails of the hind feet much compressed, and somewhat concave at the sides; tail shorter than the body, and of a dirty yellowish colour beneath.

Inhabits ———— ?

Dr. Wagner compares his *Halm. leptonyx* with the *H. Bennettii*, from which he says it differs in having a much shorter tail, and in the compressed form of the claw or nail of the great fourth toe of the hind foot: it is described as follows. "Ears moderately long; the tail, which is densely clothed beneath with bristly hairs, shorter than the body; the external claw, as well as the central one, compressed inwards from the outer side; the fur dense, long, and moderately soft; colour of the upper parts of a dingy yellow-brown, with pencilling of a lighter tint, and, on the back of the neck, the brown is blended with clean ferrugineous yellow, whilst, upon the sides of the body and the posterior extremities, the brown

colour is pencilled with grey-white, the latter tint predominating: on the upper parts, the hairs are dingy brown, and have a white ring below the point; and this ring is broader on the hairs of the sides of the body, and thus produces a lighter general tint on these parts; the whole of the under parts, as well as the inner side of the legs, are grey-white, but the hairs are grey-brown at the roots. The woolly hairs are more distinctly coloured. The upper surface of the head is of the same colour as the back, and on the cheeks is a whitish mark, extending backwards from the angle of the mouth; the muzzle is blackish; the ears have whitish hairs towards the margins internally, and, externally as well as internally, the apical portion has black hairs; the fore feet, and toes of the hind feet, are black-brown, and the tail is black, pencilled with whitish upon the upper surface; on the under surface the hairs are yellow white."

	Inches.	Lines.
The length of the body is	23	6
" of the tail	15	0
" of the ear	2	6
" of the tarsus and claw	7	0
" of the claw alone	1	2

In page 36, No. 3-4, for 1842, of Wiegman's Archiv., Wagner says, he has not satisfied himself whether his *H. leptonyx* is identical with my *H. Bennettii*, for, notwithstanding the similarity in colouring, &c., the form of the claw is so remarkable in *H. leptonyx* that he should consider it as a good species, unless that character be found in *Bennettii*.

With regard to these observations, I may state that, though I have found the nail or claw of the great central toe in *Bennettii* to vary somewhat in its form, I have not met with any specimen which can be said to agree with Prof. Wagner's description. The fact is, the claw in *Bennettii* offers nothing peculiar: in an adult specimen it is about one inch in length,

and half an inch in width at the base, is gradually attenuated from the root to the extremity, which is more or less sharply pointed, and its transverse section would present the form of a triangle, but with the angles somewhat rounded, and the base of the triangle would be formed by the under surface of the claw. As these claws, however, are often much worn by usage, they of course will differ in different individuals, and sometimes be short and obtuse, as described by Mr. Ogilby; and in specimens kept in confinement, where they are not worn away at the point in proportion to their growth at the base, they often attain a considerable length, and sometimes very singular forms. In a specimen of *Macropus giganteus* in the British Museum, the claws of the fore foot, from some such cause, have attained the length of from two, to three or four inches, and are spirally twisted. I suspect the *M. leptonyx* will prove to be founded upon a young specimen of *M. ruficollis*.

MACROPUS (*Halmaturus*) UALABATUS.

Black-tailed Kangaroo.

Kangurus Ualabatus.	LESSON et GARNOT, Zool. de la Coquille, tom. 1, p. 161, Plate 7. 1826.
Macropus Ualabatus.	LESSON, Manuel de Mamm. p. 227. 1827.
Macropus Ualabatus.	WATERH. Marsupialia, p. 219. 1841.
Kangurus Brunii.	DESM. Mammal. p. 275. 1820.
Halmaturus Lessonii.	GRAY, Mag. Nat. Hist. Vol. 1, (New Series), p. 583. 1837.
Halmaturus nemoralis.	WAGNER, in Schreber's Saug. Suppl. Part 111-112, p. 114, November 30, 1842.

Fur moderately long, somewhat harsh to the touch, and somewhat glossy; general colour deep brown, suffused with reddish on the hinder parts of the body; feet and tail almost entirely black; the hairs longish, and very harsh; under parts of the body of a rusty yellow colour; ears with deep yellow hairs

on the inner side; externally dusky, but of a rust colour at the base: a large blackish patch is situated immediately behind the base of the fore leg.

Inhabits New South Wales.

The present species has received the English name of *Black Wallaby* from Mr. Gould, but although, compared with most other species, its general colouring is dark, it is far from black. The English name Black-tailed *Kangaroo* has appeared to me less likely to mislead. In size the *M. Ualabatus* is scarcely inferior to the *M. ruficollis*; it must rank, therefore, among the larger species of its section, and from these it may readily be distinguished by its general dark colouring, its coarsish and somewhat glossy fur, the dark patch immediately behind the base of the fore leg, the rufous tint at the base of the ear in front, the reddish or yellowish tint of the abdomen, and the almost uniformly black tail.

"This well-marked species," observes Mr. Gould, "inhabits, with but few exceptions, all the thick bushes of New South Wales, especially such as are wet or humid. I hunted it successfully at Illawarra, on the small islands at the mouth of the Hunter, and on the Liverpool ranges. In the former localities it was frequently found in the wettest places, either among the high grass, and other dense vegetation, or among the thick mangroves, whose roots are washed by each succeeding tide. The islands at the mouth of the Hunter, particularly Mosquito and Ash Islands, are not unfrequently flooded to a great extent, yet it leaps through the shallow parts with apparent enjoyment, and even crosses the river from one island to the other. On the Liverpool range it as strictly keeps to such parts as are most humid; often near the crowns of mountains, which are frequently enveloped in fogs and dews."

The following is a description of a fine male specimen in Mr. Gould's collection:—

Fur moderately long, somewhat stiff, and more glossy than

in most other species of *Macropus*: general colour very dark brown, the visible portions of the hairs being pencilled with rust colour and black, but next the skin (on the back) they are almost black; head greyish: the crown, occiput, and region of the ears, of a rich rusty red colour; cheek-mark distinct, and of a rich yellow hue; muzzle dusky above; towards the apex, and immediately round the eye, the hairs are of the same colour; chin white; throat rich golden yellow, shaded gradually behind into the rusty red of the under parts of the body, which is deepest between the hind legs; the hairs on the under parts are, however, grey at the roots; a broad black patch is situated immediately behind the fore leg; ears with yellow hairs internally; externally, of a deep rusty red, suffused with brownish, but with the apical third deep brown, inclining to black; the margin pale; shoulders and fore legs greyish; the hairs on these parts pencilled with black and yellowish white; hands and wrists black, slightly pencilled with whitish; tarsi black, obscurely freckled with yellowish above, distinctly pencilled with this colour on the outer side, and of a rusty hue on the inner side; tail black, slightly pencilled with whitish at the base and along the sides; the hairs long, stiff, and glossy; beneath brownish.

A female specimen, also in Mr. Gould's collection, had the forehead, cheeks, shoulders, and sides of the belly, grey: the abdomen is sometimes of a palish yellow hue.

	No. 1.		No. 2.		No. 3.		No. 4.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from nose to ear . . .	34	0	32	0	29	6	34	0
" of tail, about	26	0	24	0	24	0	26	0
" from nose to ear . . .	5	3	5	0	4	2		
" of ear	3	0	2	6	2	6	2	7
" of tarsus, toes and claws .	8	4	8	0	7	3	7	8

The dimensions in the first column are from the male specimen above described, those of the second column are from a specimen in the British Museum, and the other two are from specimens in the Paris Museum. Column No. 3 gives the admeasurements of an individual brought from Port Jackson, in the expedition of the Astrolobe, and is the original of M. Lesson's description. The dimensions in the last column are taken from a very old specimen, which is, I suspect, the original of Desmarest's description under the name *Kangurus Brunii.* On the bottom of its stand is written "*Kanguroo Filandre, K. d'Aræ, Didelphis brun.*" I perfectly agree with Lesson, that this is the same as his *M. Ualabatus.* The *Didelphys Brunii* is a very distinct animal.

The following dimensions are from a skull of *M. Ualabatus* in the collection of the British Museum, and which is labelled as having been procured in Mosquito Island :—

This skull is rather narrower, and more elongated than usual ; the nasal bones are long, very convex, but little expanded behind, and somewhat contracted in the middle ; the bony palate terminates very nearly in a line with the hinder margin of the last molar ; the posterior palatine openings are rather small compared with many of the Halmaturi ; the occipital opening is very large, and has a distinct notch in the upper margin ; the premolar tooth is unusually large, its length being equal to the first true molar added to about one-third of the length of the second, whilst, in most of the Kangaroos, the corresponding tooth is about equal to the first true molar in length, as in *M. Thetidis,* and sometimes shorter, as in *M. giganteus.* In the more elongated form of the skull, and greater size of the premolar, the *M. Ualabatus* evinces an approach to the New Guinea Kangaroo, *M. Brunii.* The incisor teeth of the upper jaw are represented on Plate 5, fig. 12.

	Inches.	Lines.
Total length of skull	5	3
Width	2	8
Length of nasal bones	2	$3\frac{1}{3}$
Width of ditto at the base	0	$9\frac{2}{3}$
" " *near the apex*	0	$6\frac{1}{2}$
Length of frontal bones	1	9
Width between orbits	1	$0\frac{2}{3}$
Length of palate	3	$1\frac{1}{2}$
Width of ditto opposite third molar	0	$11\frac{1}{4}$
Length of posterior palatal openings	0	$5\frac{1}{2}$
" of the five molar teeth taken together ...	1	$7\frac{2}{3}$
" of the premolar	0	$4\frac{2}{3}$
Distance between incisors and premolar	1	2

MACROPUS (*Halmaturus*) EUGENII.

Eugene Island Kangaroo.

Kangurus Eugenii. Desm. Nouv. Dict. d'Hist. Nat. tom. xvii. p. 38; Mammalogie, p. 274.

Macropus Eugenii. Lesson, Manuel de Mammalogie, p. 227.

Halmaturus Dama, and *H. gracilis*. Gould, Proceedings of the Zoological Society; the former in the Part for February 1844, p. 32, and the latter in the Part for June 1844, p. 103.

" Total length, measured from the tip of the muzzle to the root of the tail, about twenty-one inches (French measure); head four inches, and tail rather more than one foot in length. Fur very soft, somewhat like that of *M. ruficollis;* its general tint grey brown, but mixed with rust colour near the shoulders, on the back of the neck, and upper surface of the head, as well as the fore legs; the whitish colour of the under parts pretty distinctly separated from the deeper colour of the upper parts; under surface of the tail white, slightly tinted with reddish; upper surface grey brown; each hair of the back is grey at the root, and annulated with brown, and with whitish externally, but the extreme point is brown; the hairs of the shoulders and back of the neck are grey at the root, then rust coloured, followed by white, and rust colour at the apex."

The above description is from Desmarest: unfortunately the specimen upon which it is founded no longer exists. In size and colouring the *M. Eugenii* must greatly have resembled the *M. Derbianus;* but there is no mention in the diagnosis of a black mark on the back, such as is noticed in that species. A small Kangaroo, described by Mr. Gould under the specific name *Dama*, wants this black mark, and in other respects agrees with Desmarest's description. One of Mr. Gould's specimens of *M. Dama* now in the British Museum collection is from the neighbourhood of Moore's River; and another is labelled as from Wangan Swamps, both in Western Australia, where it is by no means improbable we should find the *M. Eugenii*, supposing Desmarest to be correct with regard to the habitat of the original specimen: that specimen, he says, to his knowledge, once was labelled as being from St. Peter's Island, and subsequently the label was changed for one giving Eugene Island as the habitat; both islands, however, are in Nuyt's Archipelago. Following are descriptions of the *M. Dama* and *M. gracilis* of Mr. Gould, which I regard as the same species. The dimensions of *M. Eugenii* are reduced to English measure, and arranged with those of the *M. Dama.*

Halmaturus Dama. GOULD.

Male.—General colour above, rusty brown, but considerably pencilled with black; back of neck, shoulders, and fore legs, bright rust colour; flanks and hind legs externally suffused with rust colour; under parts white; chest yellowish: head grey, obscurely tinted with rust on the crown and in the region of the eye; tip of muzzle brownish; cheek-mark moderately distinct; ears grey externally, becoming nearly black at the apex: feet rusty white; toes slightly freckled with brown: tail grey. Weight about 10 lbs.

Female. — General colour greyish, but little tinted with rust

colour; neck, shoulders, and fore legs, of a pale rust colour, much pencilled with white; body beneath, grey-white: tail with a black mark along the upper surface of the apical portion.

This animal is said to be called "*Dama*" by the natives.—Inhabits Western Australia.

	M. Eugenii.		MALE. M. Dama.		FEMALE. M. Dama.	
	Inches.	Lines	Inches.	Lines	Inches.	Lines
Length from tip of nose to root of tail	22	8	23	0	22	0
" of tail, about	13	0	15	0	14	0
" of tarsus and nails			6	0	5	8
" of the great central toe-nail			0	9	0	7½
" from nose to ear	4	4	3	9	3	9
" of ear			2	6	2	3
" of fore arm, hands, and nails			5	9	4	9
" of hand and nails			1	9	1	5½
of which the nail of central finger is			0	5	0	5½
" of the three upper incisors ...			0	5½		

M. Dama differs from *M. Derbianus*, not only in wanting the black mark on the back of the neck, but in having the fore legs much more slender, and the hands smaller, the tarsi longer, and the ears larger: the upper incisor teeth are rather larger—they are represented on Plate 5, fig. 8. The smaller size of this animal, its rufous fore legs, and the structure of the upper incisor teeth, serve to distinguish it from the *M. Thetidis* of the East coast.

Mr. Gould's *Halmaturus gracilis*, I feel no doubt, is specifically identical with the *H. Dama*. Two specimens in the British Museum collection, and which formerly belonged to Mr. Gould, present the following characters:—

Macropus gracilis. Gould.

Fur soft; general colour ashy grey, slightly suffused with rufous on the back of the neck, shoulders, fore legs, and on the outer and hinder parts of the hind legs and sides of the tarsi; under parts white, very faintly tinted with grey, and in parts with yellowish; ears externally, and tail above, grizzled with black and white, the latter dirty yellowish white beneath, and with a line along the upper surface of the apical portion, formed of blackish hairs; feet rusty white, the toes brownish.

Inhabits Western Australia.

	Female.		Male.		H. Dama.	
	Inches.	Lines	Inches.	Lines	Inches.	Lines
Length from tip of nose to root of tail	18	6	18	0	18	6
" of tail	12	6	12	0	12	9
" of tarsus and nails	5	1	5	4	5	3
" of ear	2	0	2	0	2	1
" of fore arm, hand, and nails	?		4	0	4	2
" of the three upper incisors	0	$5\frac{1}{3}$	0	$5\frac{1}{2}$	0	5

The two specimens of *H. gracilis* referred to are labelled as being from " Walyema Swamps, 40 miles N.E. of Northam, Western Australia:" they are young animals, as may be seen by the condition of their incisor teeth; the posterior incisor of the upper jaw, for instance, in one specimen, is a new tooth, the cutting edge of which had not attained the same level as the other two incisors, and is perfectly unworn; as is also the case with the other specimen, though the same tooth is here a little more advanced. Both the specimens were shot when casting their fur, and hence their general colour is paler, and more grey, than is that of the specimens of *M. Dama*

described; for the darker hue in the latter case is due to the longer and harsher hairs of the fur, which hairs being almost entirely wanting in *M. gracilis*, the softer grey under fur is exposed. An immature specimen of *M. Dama*, sent with the male and female from which my descriptions are taken, and forming part of the British Museum collection, furnished the dimensions given in the third column. The structure of the incisor teeth is the same in *M. gracilis* and *M. Dama;* and it will be seen by the dimensions just referred to, that (making a slight allowance for measurements taken from skins) the proportions are the same.

MACROPUS (*Halmaturus*) THETIDIS.

Pademelon Kangaroo.

Halmaturus Thetidis, F. CUVIER ET GEOFF., Mammifères, Tab. 55.
" " (F. CUVIER,) LESSON, in the Zoological portion of M. Bougainville's "Journal de la Navigation autour du Monde de la Frégate Thétis, &c." tom. ii. p. 305, Pl. 37.
" (*Thylogale*) *Eugenii*, GRAY, Magazine of Natural History, 1837, vol. i. (New Series,) p. 583.
Macropus Eugenii, WATERHOUSE, in Catal. of the Mammalia preserved in the Museum of the Zoological Society, 1838, p. 66, sp. 644, Marsupialia, p. 232.
Halmaturus nuchalis, WAGNER, in Schreb. Saugeth., Suppl. 111—112, Heft. p. 128, Nov. 1842.
" *Thetidis* (*Pademelon Wallaby*,) GOULD, Monogr. Pt. 2, and Pl. 6.

Fur moderately long and soft: general hue of upper parts brown-grey; under parts white, but sometimes tinted with pale rusty yellow on abdomen; shoulders, back of neck and flanks, bright rusty-red; feet uniform brown, by no means dark; fore legs grey: tail clothed with short hairs; above grey, beneath brownish-white: ears grey at the base externally.

Inhabits New South Wales.

The "*Pademelon Wallaby*" of the colonists, is a small species, about twenty inches in height when sitting up on its hind legs, and is an inhabitant of New South Wales, where it is very abundant. Mr. Gould states, that it is strictly a brush animal, and that he has met with it in all the districts, where the low shrubs abound, from Illawarra to the Hunter; he had moreover received specimens from Moreton Bay. As an article of food it is highly prized, its flesh being tender and well flavoured, and very like that of the Common Hare.

Specimens of this species were brought alive to Europe, by the officers of M. Bougainville's voyage of the French vessel Thetis, and these lived for some time, and brought forth young, in the Menagerie of the *Jardin des Plantes* of Paris. It is upon these specimens that M. F. Cuvier founded his *Halmaturus Thetidis*, naming the species after the vessel just mentioned. M. F. Cuvier, however, in his account, alludes to a specimen, as belonging to the same species, which he states had long existed in the Paris Museum, where it had been regarded as the young of the *Macropus ruficollis*. Now M. Desmarest had previously characterized an animal under the name of *Kangurus Eugenii*, founded as he observes upon a Kangaroo of the Paris Museum, which had been regarded as the young of the *Macropus ruficollis*,[1] and from this circumstance, (together with a tolerably close agreement in the descriptions given by the two authors mentioned,) I was induced to sink the name *Thetidis* as a synonym of *Eugenii*.[2] Mr. Gould is of opinion that the *M. Eugenii*, which is said to be from Eugene Island, on the West Coast, is distinct from the New South Wales animal, *M. Thetidis*, and that it is identical with the *M. Derbianus*,

[1] I found no Kangaroo with the name *Eugenii* in the Paris Museum. It is somewhat remarkable that M. F. Cuvier should have made no mention of *M. Eugenii*, when he described the *H. Thetidis*.

[2] In page 232 of the volume on Marsupialia in the "Naturalists' Library."

which also inhabits the West Coast. One phrase in Desmarest's description favours this opinion, for he states, that the fore feet are red like the neck, &c., a character found in *Derbianus*, but not in *M. Thetidis:* he makes no mention, however, of the broad black mark on the back of the neck, which is observed in *M. Derbianus*, nor can I find any points either in his description, or in that given by Péron and Lesueur (the original describers of *M. Eugenii*) which would satisfactorily settle the question. There are several small Kangaroos so closely allied to the species under consideration, that it will be necessary to give a somewhat detailed description of each.

The following notes were recently made by the author upon the original specimens of M. F. Cuvier's *Halmaturus Thetidis.*

Male.—Neck and shoulders of a bright rust colour; hinder parts of the back of a rusty brown hue, distinctly pencilled with black, and rather less distinctly pencilled with rusty white; sides of the body chiefly of a rust colour, but freely pencilled with white; a pale rusty white mark crosses the haunches; under parts of the body, as well as the fore part of the hind legs, white; the outer and hinder parts of the hind legs chiefly of a rust colour: fore-arms ashy grey, the hands almost uniform in tint with the fore-arm, but very indistinctly suffused with brown: tarsi brown, almost uniform in tint, and by no means dark: tail sparingly clothed with short stiff hairs; on the upper surface chiefly of a black colour, but slightly grizzled with white; the under parts dirty yellowish white: head pale rust colour, much pencilled with black, especially on the vertex; muzzle palish brown; upper lip white; the pale cheek mark indistinct; ears with white hairs internally, and grey externally, the hairs being partly black and partly white.

The fore legs in this male specimen are large and strong,

and the tarsi are short and stout: on the fore half of the body the hairs of the fur are short, stiff, and very closely applied to the skin; those on the neck, both above and below, are directed forwards, and towards the sides, slightly outwards; immediately behind the shoulders the hairs on either side of the body are directed inwards, and the points, meeting in the middle line of the back, form a little crest: on other parts the hairs have the usual direction—those on the back are of a very pale grey at the root; each hair is then brown, and this colour is followed by a ring of white, which is shaded through rust colour into black: on the chin, throat, and chest, the hairs are uniformly white to the root, and on the abdomen they are nearly so, being but slightly tinted with grey at the root.

The remaining two specimens in the Paris Museum are females, and are of a smaller size than the male just described; they, moreover, have the fore legs much smaller and more slender, and the tarsi less stout. The fur of the neck is soft, loose, and nearly erect; the white hairs of the throat and chest differ likewise in being tinted with pale grey at the root, like those of the abdomen. The body is rusty brown above, freely pencilled with black, and rusty white; the back of the neck and shoulders are of a bright rusty red colour, and so are the flanks, though here of a paler hue: a rusty white mark crosses the haunches: the ears are grey externally, as well as the occipital portion of the head; the muzzle is brownish; the fore-arms pale yellowish grey, the hands pale brown, and the tarsi of a deeper brown; the tail is sparingly clothed with short stiff hairs, which have a general grey tint; on the under parts the hairs are of a dirty yellow colour.

In this species the front of the muzzle is naked, but the small hairs extend on to the hinder part, so as nearly to form a simicircle, running downwards, or forwards, on each side from the posterior angle of the nostril opening: there is also

a narrowish naked space beneath the nostril, but this does not extend back to the posterior angle. The second incisor tooth of the upper jaw is rather broader than the first, and the third is distinctly the broadest, and has a notch behind, marking the separation of the posterior lobe from the body of the tooth, and is so far back that but a very small portion of the lobe in question is visible when the tooth is viewed from the outer side.

	Male.		Female.		Female.	
	Inches.	Lines	Inches.	Lines	Inches.	Lines
Length from tip of nose to root of tail	26	0	24	0	23	0
" of tail	18	9	14	6	16	3
" from nose to ear	4	3	3	9	3	11
" of ear	2	3	2	0	1	10
" of fore-arm, hands, and nails	6	8	4	8	4	7
" of the nail of middle finger...	—	9	—	7		
" of the tarsus and nails ...	6	6	5	4	5	6
" of the nail of the central toe	1	2	—	10		
" from tip of central toe to the apex of that of outer toe ...	1	0	—	11		
" from ditto to the base of nails of the inner double toe ...	1	7	1	3½		
" of the three incisors of the upper jaw	—	?	—	6		

In general form, the skull of *M. Thetidis* nearly resembles that of the cranium of *M. Ualabatus;* the nasal bones, however, in the last mentioned animal are less produced in the mesial line, behind, and they are broadest at the base, whilst in *M. Thetidis* the nasal bones are nearly of the same width from the base to the intermaxillary suture, in front of which they are considerably contracted; the posterior palatine openings are much larger, and the premolars smaller. In the skulls of both these animals I have seen the alveoli for small canine teeth.

The following dimensions are from two skulls of *M. Thetidis*,

one of which is contained in the collection of the British Museum, and is from Mosquito Island, at the mouth of the Hunter River. Its dimensions are given in the first column, and it is figured in Plate 2; the other skull is in the College of Surgeons, and was brought home by Mr. Gould.

	No. 1 Inches.	No. 1 Lines.	No. 2. Inches.	No. 2. Lines.
Total length of skull	4	$4\frac{1}{2}$	4	0
Width	2	$3\frac{2}{3}$	2	$2\frac{1}{4}$
Length of nasal bones	1	$10\frac{1}{2}$	1	$6\frac{1}{4}$
Width of ditto at the base ...	—	8	—	7
" " near the apex ...	—	$4\frac{1}{2}$	—	4
Length of frontal bones ...	1	7	1	6
Width between orbits	—	$8\frac{1}{2}$	—	8
Length of palate	2	8	2	4
Width of ditto opposite the third molar	—	10		
Length of posterior palatine openings	—	8		
" of the five molar teeth taken together ...	1	$3\frac{1}{4}$	1	$3\frac{1}{3}$
" of the premolar	—	$2\frac{1}{4}$		
" of the three incisor teeth taken together ...			—	6
" of lower jaw	3	$4\frac{1}{2}$		
Height of ditto in a vertical line dropped from the apex of the coronoid process	1	$9\frac{1}{2}$	1	8

Fig. 2.—Plate 2 represents the skull as viewed from beneath, half the natural size; 2, *a*, the lower jaw viewed from the outer side; 2, *b*, the lower jaw viewed from above; 2, *c*, the incisor teeth of the upper jaw represented of the natural size; 2, *d*, shews the cutting surface of the same teeth.

MACROPUS (*Halmaturus*) PARMA.

Parma Kangaroo.

Halmaturus Parma. Gould, in Mr. Gray's List of the Mammalia in Brit. Mus. 1843, p. 91.

Fur moderate; general colour rich rufous brown, pencilled with whitish; much pencilled with black on the back; under parts

dirty rusty white; neck and shoulders brownish rust colour, the former with a longitudinal black mark; throat and chest pure white: tail sparingly clothed with short, black hairs above; beneath dirty white; feet brown.

Inhabits New South Wales.

In the list of species of Mammalia contained in the British Museum collection, the name of *H. Parma*, occurs as a species described by Mr. Gould in the Proceedings of the Zoological Society; I have not, however, found any animal noticed under that name in the work mentioned. Mr. Gould informed me that he had doubts whether he had described it. The Parma Wallaby, I think, merits the distinction of a species. It is intermediate between the *H. dorsalis*, and the *H. Derbianus*, and may be distinguished from either by its deep reddish brown colour, and the distinct large white patch on the throat and chest; the hairs forming this patch are white to the root; in *H. Derbianus* they are distinctly grey next the skin, and in *H. dorsalis* they are very slightly tinted with grey at the root in the same parts, and this circumstance, combined with the general form and superior size of *H. Parma*, caused me at first sight to think it might be a variety of the latter animal; I soon perceived, however, that it differed much from *H. dorsalis* in the form and size of its incisor teeth (see Pl. 5, fig. 7), and in the proportion of the tarsus; the three incisors on each side of the upper jaw in *H. Parma* measuring together only five lines, whereas they are 7½ lines in *H. dorsalis;* the tarsus of the present animal is much shorter, as will be seen by the dimensions. The fur is moderate, both as to length and texture; the general colour is deep reddish brown, pencilled with white, and much pencilled with black on the back; on the sides of the body the white is less distinct, and, as the black is wanting, or nearly so, the general hue is paler; the fur on these parts is of a very deep grey next the skin; on the under parts of

the body each hair of the fur has the basal half grey, and the external half whitish, but tinted with rust colour; on the throat and fore part of the chest, however, the hairs are uniform white. The back of the neck and shoulders, as well as the fore legs, are brownish rust colour, and there is a narrowish longitudinal black mark, which extends from near the occiput along the back of the neck. The head is ashy grey, tinted with rufous, and finely tinted with whitish; the pale cheek-mark is indistinct; the chin brownish; the back of the ears are clothed with hairs like those of the head; on the inner side there are scarcely any hairs; the few which are seen are whitish. The feet are brown, finely pencilled behind with very pale brown. The tail is very sparingly clothed, and, excepting at the base, the scales are distinct: on the upper surface the small, stiff, scattered hairs are black; quite at the root, the tail is clothed with hairs like those of the body; on the under side the hairs are more numerous, and of a dirty white colour. The foremost and hindermost incisor teeth are about equal in width; the middle incisor is but little more than half the width of the other two: the posterior incisor has an indistinct notch on the hinder third part.

	Inches.	Lines.
Length from tip of nose to root of tail ...	26	0
" of tail	19	0
" of tarsus	6	3
" of ear	2	1
" from tip of nose to ear	4	1
" of fore-arm, including the hands and claws	5	3

MACROPUS (*Halmaturus*) DORSALIS.

Black-striped Kangaroo.

Halmaturus dorsalis.	GRAY, Magazine of Natural History, for November, 1837, Vol. i. (New Series). p 583.
" "	GOULD, Monograph, Pt. 1, Pl. 8.
Macropus (Halmaturus) dorsalis.	WATERHOUSE, Naturalists' Library, Marsupialia, p. 230.

Fur moderate; general colour brownish grey; neck and shoulders rusty red; under parts of the body white; fore and hind feet with the toes brown-black; tarsi whitish behind; tail grey above: a distinct black mark, commencing rather low down on the back of the neck, extends about half way along the back.

Inhabits New South Wales.

The *M. dorsalis* is considerably larger than the *M. Derbianus*, which also has the black dorsal stripe; in this latter animal the stripe in question is almost confined to the neck, whilst in *M. dorsalis* (where it is more distinct), it is chiefly confined to the back; the under parts of the body are pure white in the present species, or very nearly so, whilst in *M. Derbianus* they are of a dirty greyish white, and not unfrequently somewhat suffused with reddish. The subjoined description is taken from the original specimen described by Mr. Gray, which is in the collection of the Zoological Society. Specimens brought home by Mr. Gould may now be seen in the National Collection.

The fur is of moderate length, and somewhat harsh to the touch; its predominant hue brownish grey, indistinctly suffused with rufous; the occiput, back of neck, shoulders, and fore legs, are of bright rusty red colour; the chin, throat, and the whole of the under parts of the body, are

white, and the hairs on these parts are uniform to the root: a well defined black mark extends along the back, commencing in a point over the shoulders, and terminating about half way down the back: on the cheeks is a whitish mark, which has its origin on the upper lip, and terminates beneath the eye: the ears are clothed internally with whitish hairs, and externally, at the base, with hairs of the same rusty grey tint as those of the head; but, at the apical portion of the ear, the hairs are shorter, and of a dusky colour: the fore and hind feet have the toes brownish black; the tarsi are whitish behind, but freely pencilled with dark brown on the anterior half; the tail is as long as the body, grey above, and of a dirty yellowish tint beneath; rather sparingly clothed above with short stiff hairs, which do not perfectly hide the scales, these being usually developed on this organ in inverse proportion to the hairs; on the under surface the hairs are longer, and more dense; an indistinct whitish mark crosses the haunches externally. The foremost incisor tooth of the upper jaw is nearly twice as broad as the second, and the third is rather broader than the first; it has a vertical groove in the middle of the outer surface, or perhaps even slightly in advance of the middle line—see Plate 5, fig. 14.

	Inches.	Lines.
Length from tip of nose to root of tail	27	1
" of tail	21	0
" of tarsus	7	6
" from nose to ear	4	8
" of ear	2	5

Fine male specimens sometimes exceed these dimensions, being about 30 inches in length from the nose to the root of the tail; and the females usually furnish dimensions rather less than those above given. A skull of a male specimen of *M. dorsalis*, in Mr. Gould's collection, presents the following dimensions:—

	Inches.	Lines.
Total length	4	8
Width	2	4½
" between the orbits	0	9½
Length of nasal bones	1	9
Width of ditto behind	0	7¼
" " near the apex	0	5¾
Length of posterior palatine openings	0	7¾
" of the three incisors of upper jaw ...	0	6⅔
Distance between upper incisors and molars ...	1	1¾
Extent of molars	1	5
Length of premolar tooth, upper jaw	0	3
" of lower jaw	3	2½
Height of ditto, from the apex of the coronoid process	1	8½

Like others of the section of Kangaroos to which the Black-striped Kangaroo belongs, the present species frequents those districts which are well clothed with dwarf shrubs. It is apparently confined to the interior of New South Wales, and is said to be found in great numbers in the scrubs clothing the sides of the hills that run parallel to the rivers Mokai and Namoi; and Mr. Gould found it especially abundant at Brezi, to the northward of the Liverpool plains, and in the Brigaloe brush, on the Lower Namoi. He often shot these animals for food, their flesh being excellent. They are trapped by the natives, both for their flesh and for their skins, which are used for clothing.

MACROPUS (*Halmaturus*) DERBIANUS.

Derby's Kangaroo.

Halmaturus Derbianus. **GRAY, Magazine of Natural History, vol. i. (New Series), p. 583; GOULD, Monogr. Part 1, Pl. 11.**

Macropus (Halmaturus) Derbianus. **WATERHOUSE, Marsupialia, Naturalists' Library, p. 234, Plate 21.**

Halmaturus Houtmanni. **GOULD, Proceedings of the Zoological Society for Feb. 1844, p. 31.**

Fur long and moderately soft; grey, indistinctly tinted with rust colour; back of the neck, hinder part of back near the root of the tail, the base of the tail, and the limbs, rusty red; under parts of the body dirty white, slightly washed, as it were, with rusty yellow; fore feet and tarsi pale rust colour, very finely pencilled with blackish in front: tail clothed with short hairs, grey above, and dirty white beneath; a broad, but not strongly defined, black mark, extends from the occiput along the back of the neck.

Inhabits Western and South-western Australia.

The original of Mr. Gray's description was said to be from Swan River; it lived for some time in the Earl of Derby's Menagerie, and when it died was presented by his lordship to the Museum of the Zoological Society. Subsequently, a living specimen was presented to the same Society, by its active corresponding member, the late T. B. Harvey, Esq., and specimens have been procured from islands on the West Coast of Australia by Mr. Gould. This gentleman, who has taken much pains in ascertaining the true habits of the various species of Marsupial animals, is of opinion that the *M. Derbianus* is indeed strictly confined to the islands of the West coast, and states that it is found in Kangaroo Island; he had moreover seen the skin of an animal apparently identical with the present species, which he was informed inhabited Rottness and Garden Island. These islands are often covered with dwarf Eucalypti, forming what are called "scrubs," which, as Mr. Gould observes, afford a secure asylum for the small Wallabys. In these scrubs they form runs; and such is the dense nature of the vegetation, that nothing larger than a dog can follow them; still the residents in these islands procure them in great abundance, principally by snares, a simple noose being placed at the entrance of the runs; they are sought both for their flesh, which is well flavoured, and for their skins.

The present species much resembles the *H. Thetidis*, but may be distinguished by the broad dusky mark on the back of the neck, and the red colour of its legs and feet; the fore legs in Thetidis being grey and the feet uniform brown: the prevailing tint of the upper parts of the body is moreover grey, very distinctly pencilled with black and white, whilst in *Thetidis* it is brownish; the fur is usually longer, and that on the under parts of the body is never of so pure a white, exhibiting a slight greyish tint, and being generally more or less suffused with pale rust colour: the hairs on these parts are more distinctly tinted with grey next the skin; the hinder part of the back near the root of the tail is generally of a rufous tint, and so is the base of the tail, but in the *H. Thetidis* these parts are of the same brown tint as the body. The hairs on the back in *H. Derbianus* are grey at the root, shaded then into a blackish hue, which is followed by rust colour, white, and black. The upper lip is whitish, and there is a pale (nearly white) mark on the cheeks. The ears are blackish externally, and the hairs on the inner side are white, or nearly so.

	Inches.	Lines.
Length from tip of nose to root of tail	22	0
" of tail	17	0
" from nose to ear	3	$10\frac{1}{2}$
" of ear	2	0
" of tarsus	6	0

Upon a little Kangaroo found in the small islands, called Houtman's Abrolhos, situated on the west coast of Australia, north of the Swan River district, is founded the

Halmaturus Houtmanni. GOULD.

Brownish grey, pencilled with black and white; sides of body and outer side of hind legs suffused with rust colour; back of neck, shoulders, and fore legs, of a bright rust colour; under

parts grey-white, slightly tinted with yellowish on the chest: a black stripe runs from near the occiput along the back of the neck: the hairs of the hands freckled with black and rusty white; tarsi of a very pale rusty brown, freckled in front with black; the toes suffused with black: tail black above, freckled with whitish towards the base, and almost entirely black near and at the apex; beneath dirty white: head greyish; cheek-mark moderately distinct; ears grey at the base externally, but dusky beyond. Weight of the male about 11 lbs.; of the female about 8 lbs.

In the female the rusty tint on the neck and other parts is less distinct.

	Male.		Female.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	26	0	24	0
" of tail	13	0	12	6
" of tarsus and nails	5	5	5	5
" of the great central toe nail...	0	9	0	10
" from nose to ear	3	10	3	8
" of ear	1	9	1	9
" of fore-arm	4	0	3	6
" of hand and nails	1	10	1	8
" (of which the nail of central finger is	0	7	0	6)
" of the three upper incisors ...	0	4⅝	0	5

The specimens above described originally belonged to Mr. Gould, and are now in the British Museum; other specimens from the same locality have received from Mr. Gray the specific name of *Emeliæ*, in the List of Mammalia in the Collection of the British Museum, p. 90. I can discover no difference between these several specimens and the *M. Derbianus*, excepting that generally their colour is somewhat less bright, having but little of the reddish hue, but this is by no means a constant difference. Numerous skulls contained in Mr. Gould's collection I have compared with the skull of a

specimen of the *M. Derbianus* belonging to the Zoological Society, and the only difference I could perceive was, that the last mentioned cranium was a trifle larger, and had the nasal bones broader behind; but then I found the skulls of *H. Houtmanni* to vary somewhat in the width of the nasal bones; in some being only 6 lines wide at the base, and in others $7\frac{1}{3}$ lines at the same part, and in other species I have found the skulls to vary fully as much as is indicated in the following dimensions.

	M. Houtmanni.				*M. Derbianus.*	
	MALE.		FEMALE.			
	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.
Total length of skull	3	9	3	7	3	$11\frac{1}{2}$
" width	2	$0\frac{1}{2}$	1	$11\frac{1}{2}$	2	$1\frac{2}{3}$
Width of inter-orbital space . .	0	$7\frac{3}{4}$	0	$7\frac{1}{2}$	0	$9\frac{1}{3}$
Length of nasal bones	1	$5\frac{1}{2}$	1	$4\frac{1}{4}$	1	$4\frac{1}{4}$
Width of ditto behind	0	$6\frac{1}{2}$	0	$7\frac{1}{4}$	0	9
" " near the apex . .	0	4	0	$4\frac{1}{2}$	0	$4\frac{1}{2}$
Length of posterior palatine openings	0	$6\frac{1}{2}$	0	$6\frac{1}{3}$	0	$5\frac{1}{2}$
" of the three upper incisor teeth	0	$4\frac{1}{2}$	0	$4\frac{1}{3}$	(?)	
" from upper incisors to molars	0	$10\frac{3}{4}$	0	10	0	$9\frac{1}{4}$
" of upper premolar . . .	0	$2\frac{1}{3}$	0	$2\frac{1}{4}$	0	$2\frac{1}{2}$
" of the five molar teeth taken together	1	$1\frac{1}{3}$	1	$0\frac{1}{4}$	1	$2\frac{1}{3}$
" of lower jaw	2	7	2	$6\frac{3}{4}$	2	9
Height of ditto, in a vertical line dropped from the coronoid process	1	6	1	5	1	7

For the form of the upper incisor teeth, see Plate 5, fig. 6.

HALMATURUS BILLARDIERI.

Red-bellied Kangaroo.

Kangurus Billardierii. DESMAREST, Mammalogia, p. 452, sp. 843.
Macropus (Halmaturus) Billardieri. WATERH. Marsupialia, Naturalists' Library, p. 227; Halmaturus, id. GOULD'S Monogr. Part 1.
" *rufiventer.* OGILBY, Proceedings of the Zoological Society for February 1838, p. 23; and in Annals of Nat. Hist. for May 1838, p. 220.
Halmaturus (Thylogale) Tasmanei. GRAY, Annals of Nat. Hist. for April 1838, p. 108.
" *brachytarsus.* WAGNER, Schreb. Saug. No. 111-112, p. 121, November 30, 1842.

Ears short and rounded; fur long and rather soft; upper parts of head and body deep brown; under parts chiefly of a rusty red, and sometimes yellowish tint; lips and chin yellowish; feet brown; toes dark brown; tail moderately long, with short and harsh hairs, brown above, dirty yellowish beneath, and somewhat suffused with the same tint at the sides: height, about 18 or 20 inches.

Inhabits Van Diemen's Land.

The Red-bellied Kangaroo is readily distinguished from other small species of its group by its short ears, long dark-coloured fur, and the rufous and sometimes yellow tint of the under parts of the body. It appears to be confined to Van Diemen's Land and some of the islands in Bass's Straits. Mr. Gould regards this animal as strictly a gregarious one; hundreds, he observes, generally inhabiting the same localities. It frequents gullies, and the more dense and humid parts of the forest, particularly those that are covered with rank high grass, through which it forms numerous well-beaten tracks. From these coverts it seldom emerges, and never even ap-

proaches the outskirts of the forest, except at night; hence it is seldom seen by ordinary observers. It is very easily taken with snares, in the form of a noose, which are placed in its run; and thousands are captured in this way solely for their skins. It is one of the most highly esteemed for the table, being one of the best flavoured of the small Kangaroos, and is very generally eaten in Van Diemen's Land. Its weight is usually about fifteen or twenty pounds.

The "Wallaby[1]," as our present animal is called by the colonists, was first described by M. Desmarest. The original specimen in the Paris Museum presents the following characters:—*Tail shorter than the body; ears short and rounded; fur long and rather soft; general tint very dark; on head, upper parts of body, legs, and upper surface of tail, brown; under parts dirty yellow; lips and tip of chin yellowish white; fore and hind feet brown; toes dark brown; tail brownish yellow beneath; hairs of the fur brown-grey next the skin, each hair annulated with brownish white near the apex, and brown-black at the point; fur like that of the body covers the basal portion of the tail; on the remaining parts the hairs are harsh, shorter, and somewhat adpressed; ears clothed internally with yellowish white hairs; externally the hairs are of the same colour as those on the upper surface of the head.*

	Paris Mus.		Zool. Soc.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	21	0	25	0
" of tail	10	9	1	2½
" of *tarsus* (claws not included)	4	8	5	2
" of ear	1	9	1	8
" from tip of nose to ear ...	3	8		

In other specimens which I have examined, the colouring was found to vary somewhat, especially as regards the tint of

[1] This must not be confounded with the "Wallaby" of New South Wales, which is a distinct species.

the under parts of the body; in some it is dirty yellow[1], and in others of a rusty red tint: the upper parts of the body are sometimes very dark, being much pencilled with black. The posterior outer margin of the ear is of a rusty yellow colour; the remaining portions of the back, or outer surface of the ear, are black, or nearly so. The tarsi are short and stout, and so are the fore legs. The hair of the muzzle terminates in a line with the posterior angle of the nostrils. The second column of the dimensions gives the proportions of a male specimen, the original of Mr. Ogilby's *Macropus rufiventer*. The skull is rather large in proportion to the animal, and affords the following measurements:—

	Inches.	Lines.
Total length	4	1½
Width	2	1½
From front of anterior incisor to the posterior palatal opening	1	7
Width between anterior molars	0	6½
" between posterior ditto	0	9¼
Length of the five molars of the upper jaw taken together	1	1¾
" of the three incisors of either side of upper jaw taken together	0	5
" of lower jaw, from condyle to base of incisor	2	11
" from hinder part of condyle to fore part of coronoid process	1	0
Height in a vertical line dropped from apex of coronoid process	1	6

The upper incisor teeth are represented in Plate 5, fig. 11.

[1] A specimen which recently died in the Zoological Society's menagerie has the under parts of the body almost of a cream colour.

MACROPUS (*Halmaturus*) BRACHYURUS.

Short-tailed Kangaroo.

Kangurus brachyurus. QUOY et GAIMARD, Voyage del'Astrolabe, Zoologie, tom. i. p. 114, Plate 19.

Halmaturus (*Thylogale*[1]) *brevicaudatus.* GRAY, Catalogue of the Mammalia in the British Museum.

About equal in size to the Common Rabbit. Ears short and rounded, and rather densely clothed internally with rusty yellow hairs: fore feet proportionately rather large; hind feet short; both anterior and posterior extremities of a darkish brown colour: tail short and slender, and sparingly clothed with small hairs, which do not hide the scales: fur long, somewhat glossy, and soft; its general tint, on upper parts of body, brown, and on under parts, whitish, but suffused with yellow: on the head is a slight rusty tint, especially in the region of the ears.

Inhabits the region of King George's Sound.

This species is remarkable in its group for its short and comparatively slender tail, which is not more than about an inch and a half in circumference at the base, and resembles

[1] In the Magazine of Natural History, vol. i. (New Series), p. 583, Mr. Gray separates, as the type of a sub-genus of *Halmaturus*, the *M. Thetidis* (supposed at that time to be the *M. Eugenii*), and gives as the characters of the section, "*the hinder fold of the hinder upper cutting tooth scarcely larger than the front one, so that the tooth appears only notched behind: front incisor short, simple.*" To this sub-genus the name *Thylogale* is applied; and, in the List of the Mammalia in the British Museum, the present animal (*M. brachyurus*) is associated with *M. Thetidis*, as a second species of *Thylogale*. This section I cannot adopt, because it is founded upon characters which are too variable in nearly allied species of Kangaroos to be of importance; and the two species which are associated together are by no means nearly related, if we may judge from the structure of the skull and extremities; nor do they even agree in the structure of the incisor teeth—compare fig. 16 *a* of Plate 5 with fig. 2 *c* of Plate 3; and, beyond these objections, I may add, that the species selected as the type of the section *Thylogale*, must, in fact, be regarded as the type of the section *Halmaturus*, as defined by F. Cuvier.

that of a Rat, in being sparingly clothed with minute stiff hairs, between which, rings of small blackish scales are distinctly visible. The shortness of its ears also renders it conspicuous; these are rounded, and much hidden by the long fur of the head; they are well clothed with hairs, and those on the inner side are yellow, or rusty yellow; externally they are of the same reddish-brown tint which prevails on the head and back of the neck, but is somewhat brighter in the region of the ears. The hairs on the back are grey next the skin, broadly annulated with yellow towards the point, and black at the point, but there are numerous long interspersed hairs, which are almost entirely black, and as these are most plentiful on the middle of the back, they give to that part a deeper hue: on the sides of the body the hairs are coloured in the same manner, but the yellow portion is paler, and the tips are brownish. The hairs on the under parts of the body are grey next the skin, and of a very pale yellow tint externally. The feet are clothed with deep brown, short hairs. The head is proportionately rather large.

Until recently the *M. brachyurus* was unique in the Paris Museum, where the original specimen, brought home by the Astrolabe Expedition, is deposited. This specimen was found dead at King George's Sound, whence a specimen has been since procured by Mr. Gould, which is now deposited in the British Museum. From this specimen the above description was drawn up, and upon comparing it with my notes made upon the Paris individual, I find them to agree perfectly, with the exception of some slight differences in the dimensions. The measurements of the two specimens are as follows:—

	Brit. Mus. Inches.	Brit. Mus. Lines.	Paris Mus. Inches.	Paris Mus. Lines.
Length from nose to root of tail ...	15	6	18	0
" of tail, about	7	6	7	9
" of tarsus	3	2	4	1½
" of ear	1	3	1	2

The length of the skull, according to Messrs. Quoy and Gaimard's Plate, is 3 inches and 4 lines.

A skull of the *M. brachyurus*, in the British Museum collection (see Plate 5, fig. 16), is remarkable for the shortness of the muzzle, which, though narrow in front, is broader behind than usual; the zygomatic arches are thrown boldly outwards, and are very long, as compared with other Kangaroos: the greatest breadth of the skull is towards the posterior root of the zygomatic arches; the frontal bones are narrow; the nasal bones short, convex above, but little dilated behind, and with the sides very nearly straight. The foremost and hindermost of the upper incisor teeth are about equal in width; the second incisor is narrower; the third has a distinct notch at the apex, and situated rather behind the middle of the tooth (fig. 16*a* of Plate 5); the premolar tooth has a greater transverse diameter than usual, and, indeed, is as broad as the first true molar, and its length is nearly the same. The true molars have the anterior ridge, and the small mesial ridge, very little developed.

	Inches.	Lines.
Length of skull, about[1]	3	0
Width near the posterior root of the zygoma ...	1	$8\frac{3}{4}$
" beneath the orbits	1	5
" of interorbital space	0	$5\frac{1}{2}$
Length of nasal bones	1	$0\frac{1}{2}$
Width of ditto	0	$4\frac{1}{4}$
" near the apex	0	$2\frac{2}{3}$
Length of zygomatic arch	1	$7\frac{3}{4}$
" from the front of the zygomatic arch to the apex of the intermaxillaries	0	$11\frac{1}{2}$
" of the three upper incisors, taken together	0	4
Distance between upper incisors and premolar ...	0	5
Length of the five molar teeth, taken together ...	0	$10\frac{1}{4}$
" of the lower jaw	1	$10\frac{1}{3}$
Height in a vertical line dropped from the apex of the coronoid process	1	$1\frac{2}{3}$
Width of coronoid process, from front to back ...	0	$5\frac{3}{4}$

[1] The occipital bone is wanting, and allowed for in above dimension.

In the British Museum is a small Kangaroo, which appears to me to be specifically identical with the *M. brachyurus*, but which differs in being of a rich reddish brown colour. The fur on the back is pencilled with bright rust colour and black; on the under parts of the body it is grey, but suffused with very pale rust colour, the hairs being grey at the root, and tipped with the brighter colour; the ears are of a bright rust colour internally, and the head is almost entirely of the same hue, being but slightly pencilled with black: the fore and hind feet are brownish black, but rusty at the sides: the tail is brown-black above, somewhat reddish at the sides and at the base, and of a dirty rusty white beneath. The specimen is a female, and evidently far from adult. Its dimensions are—

	Inches.	Lines.
Length from nose to root of tail, about	15	0
" of tail, about	7	0
" of tarsus and nails	3	6
" from nose to ear, about	2	9
" of ear, about	1	1

From Augusta, Western Australia.

Sub-genus HETEROPUS.

Heteropus[1]. JOURDAN, "Comptes Rendus" for October 9, 1837, p. 522; and Annales des Sciences Naturelles, tom. vii. p. 368.

Petrogale[2]. GRAY, Magazine of Natural History for November, 1837, vol. i. (New Series), p. 583.

Kangaroos with muffle naked; the hind foot short and stout, and densely clothed with coarse hairs; the nails smallish: tail cylindrical, and clothed with long hairs, especially on the apical portion.

Inhabitants of rocky situations.

[1] From ἕτερος, altered; and ποῦς, the foot—having allusion to the somewhat abnormal structure of the hind foot, observed in the species of this section.

[2] From πέτρος, a stone; and γαλῆ, a weasel, or cat.

Nearly at the same time Mr. Gray and M. Jourdan characterised the present division as a distinct genus; but to Mr. Bennett is due the credit of having first drawn attention to the peculiarities presented by the *M. penicillatus*, which is the type of the section[1].

We have described the plain-inhabiting Kangaroos, and those which frequent the "scrubs;" the present section contains Kangaroos which are fitted for inhabiting the rocks. Whilst the Kangaroos of the plain have the fore part of the body slender and light, great strength in the hinder parts, combined with a long leg and foot, adapting them to fleetness, the tail powerful, and assisting in the support of the long body, we perceive certain modifications in the form and structure of these parts in the Rock-Kangaroos which adapt them to their particular habitats: the body, more compact in form, requires but little assistance from the tail for its support, the leverage being less, and the hind feet are, though powerful, comparatively short, and remarkably rough beneath, being thickly covered over this part with hard tubercles, which no doubt prevent the foot from slipping: the nails of the two larger toes are shorter than usual, and, indeed, in some of the species, scarcely project beyond the fleshy pads with which the toes are terminated, and on the upper surface of which the nails are placed. A long and slender foot, with long nails, as in the typical Kangaroos, it is obvious, would be ill adapted to an animal which has to leap to, and balance itself upon the small ledges of the rocks. The tail is large, but not thickened at the root, as in the plain Kangaroos; and, unlike the tail in those animals, it is clothed with long hairs, which, gradually increasing in length from the base of the tail, become very long and bushy at the opposite extremity: it serves to steady the animal in its leaps, and to balance the

[1] See the Proceedings of the Zoological Society for January, 1835.

body when perched in situations which require it, but is of little assistance in supporting the weight of the trunk. The muffle is naked, as in the scrub-inhabiting Kangaroos.

In the skull in the Rock-Kangaroos, the muzzle and nasal bones are narrow, and the zygomatic arches are more prominent than usual; but in these respects the skull in the Rock-Kangaroos greatly resembles that of *M. leporoïdes* figured in Plate 5, fig. 17; that skull, however, when viewed from beneath, presents a rare exception among the Macropus group, in having the auditory chamber expanded, and enclosed externally by a thin and nearly spherical bony plate; a character in which it approaches the skulls of the Rat-Kangaroo group, but which is not found in the *Heteropus* section. The angle of the lower jaw is less raised than in most other Kangaroos. The two posterior upper incisor teeth are rather small; the last presents a deep notch in the crown (see Plate 5, fig. 10).

MACROPUS (*Heteropus*) PENICILLATUS.

Brush-tailed Rock-Kangaroo.

(*Plate* 1.)

Macropus penicillatus. GRAY, in Griff. Ann. Kingdom, v. p. 527.

Petrogale penicillata. GRAY, Magazine of Nat. Hist. for November 1837, Vol. 1. (New Series), p. 583.

" " GOULD, Monogr. of the Macropodidæ, Part 2, eighth Plate.

(?) *Heteropus albogularis.* JOURDAN, Comptes Rendus, &c. for October 1837, p. 552; and Annales des Sciences Naturelles for December 1837, tom. viii. p. 368.

Fur long; general colour deep purplish grey; chin, mesial line of throat, and chest, white; sides of body sooty brown, almost black immediately behind the fore leg; abdomen brown or yellowish; muzzle and occiput dusky; cheek-mark greyish

white; ears with pale yellow hairs internally; externally black, but broadly margined behind and at the apex, with yellow, and greyish at the base; tail long and very bushy, being clothed with long, coarse, black hairs, excepting at the base, where they resemble those of the body; feet black, or nearly so, the tarsi densely clothed with long coarse hairs; back of the neck with an indistinct blackish mark.

Inhabits New South Wales.

The first specimens of the Brush-tailed Kangaroo brought to Europe are probably those contained in the museum of the Linnæan Society; more recently a specimen was presented to the museum of the Zoological Society by Sir Edward W. Parry, and which being exhibited at one of the Society's scientific meetings[1], Mr. Bennett called attention to the peculiarities of the tail, and the difference in the structure of the upper incisor teeth, as compared with those of the Great Kangaroo. In a note by Sir Edward W. Parry, which accompanied the specimen, that gentleman states that it was shot among rocks near Liverpool Plains, New South Wales. "As several of the same kind were seen together on more than one occasion, they appear to be gregarious. They seemed to prefer the neighbourhood of rocky ground, in which they had holes, to which, when hunted, they retreated. The first intimation received of these animals, by a gentleman referred to in the note, was, that monkeys were to be seen in a particular situation; and the manner in which they jumped about when he first approached a number of them left the same impression on his mind." They were so wild that he experienced great difficulty in obtaining a specimen.

The specimens of the Brush-tailed or Rock Kangaroo in the British Museum were also procured by Mr. Gould from the Liverpool Range; and others were obtained on the sides of the mountains facing Yarrundi on the Dartbrook, a tributary

[1] Proceedings of the Zoological Society for January 1835, Part 3, p. 1.

of the Hunter. Mr. Gould has likewise ascertained that it is very abundant on the Turi, and the other mountains situated to the eastward of the Liverpool Plains. According to the gentleman last mentioned, the Rock-Kangaroo is strictly gregarious, assembling in such numbers as to form well-beaten paths along the sides of the mountains. "Their agility in leaping from rock to rock," Mr. Gould observes, "is truly surprising, often alighting upon ledges so slight and narrow that it appears almost impossible for them to retain their footing: this power tends greatly to their protection, as neither the wily aborigine, nor their still greater enemy the Dingo, can follow them to their retreats. When closely pursued, and during the heat of the day, they seek shelter in the crevices and caverns of the rocks: to the caverns they evince a great partiality, usually, however, selecting those which have more than one outlet; a precaution rendered necessary by the frequent intrusion of the Dingo, who also resorts to similar situations. The *Macropus penicillatus* is strictly nocturnal in its habits, and during the night frequently leaves its well-beaten tracks among the rocks for the grass beds on the crowns or at the base of the mountains, but never so far from its haunts as to be unable to retreat again on the slightest alarm. It also readily ascends the trunks of sloping trees, wearing a kind of track or path on the back."

"As an article of food, the flesh of this animal is most excellent."

A specimen of the Rock-Kangaroo which was living in the menagerie of the Zoological Society in 1836, displayed the goat-like propensity of perching itself upon some small ledge, and appeared to be remarkably fond of leaping on to a narrow shelf which was raised about three feet from the ground in its den: on this it would sit and balance itself, although it would have appeared almost impossible that it could do so; and, after a short time, it would descend to leap up again.

In leaping and perching itself, the tail evidently assisted in balancing the body; *on the other hand, owing to its want* of strength at the root, it was of but little assistance in supporting the body, and in slow progression, as compared with the same organ in the typical Kangaroos.

The animal under consideration is subject to some variation in its colouring; sometimes there is only a small white spot on the chest; the tail and feet are brownish, and the abdomen of a pale dirty yellow colour. The tail is generally brownish beneath, excepting at the apex, and often has the under surface at the root of a bright fulvous colour. The sides of the body present scarcely a trace, in some individuals, of the dusky hue, excepting near the fore leg; and just above this axillary patch is a whitish mark, more or less distinct. The tarsi are usually paler behind than in front.

	Female.		Female.		Male.	
	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.
Length from nose to root of tail	24	0	25	0	28	6
" of tail (without including the hair, which is sometimes three inches long at the tip)	21	0	18	0	24	0
" of tarsus and claws	5	6	5	8	6	10
" from nose to ear	4	1	3	11	4	6
" of ear	2	2	2	0	2	9
" of fore arm, hands, and claws, about	4	9	4	9	5	0

The above dimensions have been taken from specimens in the museum of the Zoological Society and in the British Museum. Those in the second column are from a female in the latter collection, and were taken with a view to afford a comparison with a female (apparently adult) of the *M. lateralis*.

	Inches.	Lines.
Length of skull	4	2
Width of ditto	2	2½
" of interorbital space	0	9
Length of nasal bones	1	10
Width of ditto behind	0	5¾
" near the apex	0	3¼
Length of posterior palatine openings	0	7¼
" of the three upper incisors taken together	0	5¾
" from the posterior incisor to the premolar	0	10½
" of premolar	0	3¼
" of the anterior three true molars taken together	0	9¾
" of lower jaw	2	9
Height of ditto from apex of coronoid process	1	5½

The foremost upper incisor tooth is equal in width to the third, and much arched in front; the second is much narrower; the third has a deep notch on the outer side at the apex, which is situated on the posterior third of the tooth; the premolar is longer than the foremost true molar (see Pl. 5, fig. 10).

Heteropus albogularis. JOURDAN.

This species is described as having a longitudinal brown line on the head; the cheeks whitish; ears black externally, yellow internally; throat white; chest and belly rust colour; neck, and upper parts of back, grey; lower part of abdomen rusty yellow; feet and tail deep brown, the latter terminated with white.

	Inches.	Lines.
Total length, including the tail	39	7
Fore legs	4	9
Hind legs	11	10½
Body	23	9
Tail	22	2
Tarsi	3	2
Head	4	4¼

Inhabits the mountains south-west of Sydney.

I feel very little doubt that the above description is drawn

up from an animal which does not differ specifically from the *M. penicillatus* of Mr Gray; the white termination to the tail, which is the only difference worthy of notice, is very probably an individual peculiarity.

MACROPUS (*Heteropus*) LATERALIS.

Black-flanked Rock-Kangaroo.

Petrogale lateralis. GOULD, Monograph of the Macropodidæ, Pt. 2, 9th Pl.

Fur moderately long and soft; general colour brownish grey; head and fore parts of the body almost destitute of the brown hue, which, somewhat admixed with rusty yellow, is conspicuous on the hinder parts: a distinct white cheek-mark is followed above by a broad blackish band running through the eye: a black mark runs from the occiput along the back of the neck; sides of the body with a broad brownish black band, and with a narrower white band immediately above this; mesial line of abdomen of a pale buff-yellow colour: feet brown-black, more or less suffused with rich brown in parts: tail but little bushy at the basal half, which is nearly of the same general hue as the body; the apical half bushy, having long black, or nearly black, hairs.

Inhabits Western Australia—Swan River district.

Mr. Gilbert states that this species is only to be met with amongst the rocks in the interior, which are intersected with caverns; that it is remarkably shy, seldom venturing out during the day, but feeds at night in the little open patches of grass. He had never known it to stray more than two or three hundred yards from its retreats. When alarmed, it leaps most extraordinary distances from rock to rock, and with the greatest rapidity.—*Gould's Monogr.*

The Black-flanked Rock-Kangaroo greatly resembles the Brush-tailed species of New South Wales, but differs in being rather smaller, in having the fore part of the body more grey,

the black mark on the back of the neck more distinct, as well as the black and white flank bands; the tail, moreover, is much less bushy. The top of the head, back of the neck and shoulders, and the front of the fore legs, are grey; the hinder parts of the back are of a deeper hue, and are much suffused with yellowish brown; here the hairs are of a deep brown colour next the skin, and fulvous towards the point; this is followed, on each hair, by a broad white space, and the tips of the hairs are black. In front of the eye is an oblong black patch, and immediately behind the eye, the fur is also dark, but less so than in front; below this dark band thus formed, is a distinct white cheek-mark. The ears are black externally, excepting at the base, where the fur is of a brownish white, and sometimes of a yellowish tint; on the inner side of the ears, the hairs are dirty white. The occiput is nearly black, and a line of the same hue runs from this part along the back of the neck, and extends somewhat on to the back. The hinder part of the fore legs is sooty black, and a broad brownish black band runs from thence along the flanks (encroaching somewhat upon the abdomen) to the hind legs; above this band is a narrow pale mark, which is almost pure white at first, near the fore leg, but becomes less distinct, and suffused with brownish, as it approaches the hind legs. The fore feet and toes are black, more or less mottled with rich brown; sometimes almost entirely of the latter colour. The tarsi are densely clothed with long black-brown hairs; the upper surface of the foot, however, is usually suffused with brown in the middle. The nails of the central and outer toes are short, and nearly conical; they scarcely project beyond he fleshy pad of the toe, and are hidden by the long hairs of the toes. The basal half of the tail is well clothed, but by no means bushy, and the general colouring of this part is almost the same as that of the body; the apical half is bushy and black; sometimes more than half the tail is black, or nearly

so. The throat and mesial line of the abdomen are of a buff-yellow colour, inclining to white; the fore part of the neck and chest are usually greyish, but the latter is sometimes yellowish in the middle, and blackish at the sides.

	Inches	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	24	0	23	0
" of tail	17	0	16	0
" from nose to ear	4	0	3	8
" of ear	1	10½	2	0
" of tarsus	5	3	5	0
" from end of nail of outer toe to end of that of great central toe			1	3
" from end of nails of inner double toe to the same			1	4
" of fore arm, hands, and claws, about	4	9	4	0

The first of the two columns of dimensions gives the size and proportions of a male—from Mr. Gould; the second, those of a female in the British Museum collection.

The frontal bones are very concave between the orbits in a skull of the *M. lateralis*, in Mr. Gould's collection; the nasal bones are very narrow in front, and broad behind, and at this part there is a small opening on either side between the nasal bones and the nasal process of the superior maxillaries; the posterior palatine openings are large. This skull belonged to an animal which was not quite adult: its dimensions are as follows:—

	Inches.	Lines.
Length of skull	3	7
Width of ditto	2	0
" between the orbits	0	8½
Length of nasal bones	1	6
Width of ditto behind	0	6½
" " near the apex...	0	2¾
Length of the three upper incisors, taken together	0	4½
Distance between the incisor and molar teeth	0	8½
Length of the lower jaw	2	6
Height of ditto from the apex of the coronoid process	1	4

MACROPUS (*Heteropus*) INORNATUS.

Unadorned Rock-Kangaroo.

Petrogale inornata, Gould, Proceedings of the Zoological Society for January, 1842, Pt. 10, p. 5. Monograph of the Macropodidæ, Pt. 2, Pl. 10.

General colour sandy grey, grizzled over the shoulders, and becoming much lighter on the flanks; an indistinct line of a lighter hue runs along the face under the eye; a dusky red patch behind the elbow; under parts sandy white inclining to rufous on the lower part of the abdomen; arms and tarsi sandy grey passing into dark brown at the extreme tips of the toes; basal half of the tail sandy brown, the remainder black, the former colour extending along the sides of the tail for some distance towards the tip; ears sandy grey, bordered by a very narrow line of dark brown on the inner edge; a dark patch at the occiput passing into a dark line down the forehead.—Gould.

	Inches.	Lines.
Length from nose to tail	22	9
" of tail	15	3
" of tarsus, toes and nails	5	3
" of arm, hand and nails	5	0
" from tip of nose to base of ear ...	4	6
" of ear	1	10½

Inhabits the north coast of Australia.

This animal is about equal in size to the *M. lateralis*, and is readily distinguished from that and other species, (with the exception of *M. concinnus*,) by the absence of markings on the sides of the body, and the pale colour of the back of the ears, as well as of the feet. It was discovered by Mr. Bynoe, of H.M.S. Beagle, on the north coast of Australia, and is deposited by that gentleman in the British Museum.

MACROPUS (*Heteropus*) BRACHIOTIS.

Short-eared Rock-Kangaroo.

Macropus (*Petrogale*) *brachyotis*. GOULD, Proc. Zool. Soc. for Oct. 1840, Pt. 8, p. 128. Monogr. Pt. 1, 6th Pl.

Fur short, and rather closely applied to the body; general tint of upper parts, ashy brown, suffused with vinous or purplish rust colour; sides of the body, pale vinous grey; under parts dirty yellowish white: head pale brown, exhibiting the usual whitish cheek mark; the cheeks almost white; occiput with an indistinct dusky line; ears short and pointed, with pale hairs internally; externally dusky: a rusty black patch on the body immediately behind the base of the fore leg; fore feet brown; nails of the toes very short, and scarcely projecting beyond the fleshy portion, which is extremely rough beneath: tail with the basal half grey; the apical half bushy, having stiff black hairs, averaging about one inch in length.

Inhabits the north-west coast of Australia.

The specimens upon which Mr. Gould founded the *Petrogale brachiotis* were presented to him by Capt. George Grey, Governor of South Australia, who procured them at Hanover Bay, on the north-west coast, while traversing that previously unexplored region. Capt. Grey observes, that it is a very wild and shy animal, frequenting, in the day time, the highest and most inaccessible rocks, and only coming down to the valleys to feed early in the morning, and late in the evening. When disturbed in the day time it bounds among the roughest and most precipitous rocks, apparently with the greatest facility, and is so watchful and wary that it is by no means easy to get a shot at it. The heat of the sand rocks, amongst which it is always found, is, it is stated, very great, amounting in the hottest part of the day sometimes to 136°.

The short-eared Rock-Kangaroo is readily distinguished from the *M. penicillatus* and *M. lateralis*, by the absence of the black band on the sides of the body, the only remains of this dark hue being confined to a patch immediately behind the base of the fore leg; its general colouring is paler, and the fur is much shorter. The tail is less bushy; its bulk is moreover inferior; and the proportionately small size of the ears is an important distinguishing character. In its smaller size, and in the reddish hue of the upper parts of the body, it approaches the *M. concinnus*, but, besides other differences pointed out in the description, that animal does not possess any dark mark or spot on the sides of the body.

	Inches.	Lines.
Length from the tip of the muzzle to the root of the tail	21	0
" of tail	16	6
" from tip of the nose to the ear	3	8
" of ear	1	11
" of tarsi, without including the claws ..	5	0

MACROPUS (*Heteropus*) CONCINNUS.

Rufous Rock-Kangaroo.

Petrogale concinna. GOULD, Proc. of the Zool. Soc. for May, 1842, p. 57.

Fur moderately long and somewhat soft; general colour bright rusty red, but the fur of the back is pencilled with white and reddish black; under parts of body yellowish white; limbs and sides of body of a pale rust colour, the fore legs and hands inclining to white: tarsi brownish white, slightly pencilled with brown; sides of head rusty white: tail bushy, the apical third clothed with hairs, which are chiefly whitish, but tipped with black.

Inhabits the North-west coast of Australia.

I have seen but one specimen of this species of Rock-Kangaroo, which is so remarkable for its brilliant colouring and small size, being scarcely equal in bulk to most of the Kangaroo-rats: this specimen was brought to England by Lieut. Emery, of H. M. S. Beagle, and is now in the British Museum: no peculiarities in its habits are mentioned in the only published account which has as yet appeared.

The *Macropus concinnus* may be readily distinguished from its congeners, not only by its small size and bright colouring, but by the absence of any black spot behind the base of the fore leg. The head is of a palish ash colour above, slightly suffused with rust colour, this latter tint being most conspicuous above the eyes; the cheeks are rusty white, and have an indistinct greyish brown mark extending forwards from the front of the eye; the ears are of moderate length, narrow and somewhat pointed, brownish (but very pale) externally, and with a few white hairs internally. The fur on the back is grey next the skin, and this tint, at the root of each hair, is followed by brilliant rusty red, then a broad space which is white, and the tip is deep rusty brown; on the under parts of the body the fur is grey next the skin, and has the visible portion yellowish white. The fore legs are rusty white, and the hands a brown-white; the hind legs are of a pale rust colour externally; the tarsi are brownish white, but slightly pencilled with brown: on the back of the neck is an indistinct trace of a mesial darker mark. The tail is clothed at the base with fur like that of the body; beyond this the hairs are of a harsher nature, at first about half an inch in length, and on the apical third they are about an inch and a half in length, of a brownish white colour, but tipped with black.

	Inches.	Lines.
Length from nose to root of tail	13	9
" of tail	9	9
" of tarsus	4	0
" from tip of nose to ear	3	0
" of ear	1	3
" of fore legs and hands to end of nails .	3	6
" of skull	2	11
Width of ditto	1	$8\frac{1}{8}$
" between orbits	0	$7\frac{1}{4}$
Length of nasal bones	1	$1\frac{1}{4}$
Width of ditto behind	0	7
" " near the apex	0	$2\frac{1}{4}$
Length of palate	1	$6\frac{1}{8}$
" of posterior palatine openings ...	0	$4\frac{3}{8}$
" of three anterior incisors	0	$3\frac{1}{4}$

The animal to which the above skull belonged was not quite adult, since the crown of the last molar tooth is but little raised above the level of its alveolus, and what is rather remarkable, there are four teeth in front of this on one side of the upper jaw (on the opposite side it has been thrust out by the pressing forwards of the hinder teeth,) and the foremost of these has the form and structure of a true molar, and yet it does not appear to be a milk tooth. The foremost of the three upper incisors is the largest, and the hindermost has a deep groove behind the middle. The muzzle is short, and much contracted in front; the nasal bones are much dilated behind, and there is a small opening on either side at this part between the nasal bones and the superior maxillary, as in *M. lateralis;* in front, the nasal bones are very narrow: the zygomatic arch is thrown boldly outwards beneath the orbits, and the lateral ridges of the frontal bones are parallel; these bones are nearly flat between the orbits. The occipital opening is notched above.

As compared with the skull of *M. penicillatus,* that of *M. concinnus* differs in having the muzzle shorter in proportion, the nasal bones shorter, and much broader behind, the inter-

orbital space broader: in *penicillatus* the frontal bones are slightly contracted behind the orbits, but this is not the case in *M. concinnus*.

MACROPUS BRUNII. Le Brun's Kangaroo.

Filander.	LE BRUN, Voyages par Moscovie, en Perse, et aux Indes Orientales, tom. ii. p. 347. 1718.
Didelphis Brunii.	SCHREBER, Saugeth. iii. p. 551, Pl. 153. 1778.
" *Asiatica.*	PALLAS, Act. Acad. Sci. Petrop. for 1777, Pt. 2, p. 229, Tab. 9, figs. 4 and 5. 1780.
Javan Opposum.	PENNANT, Hist. of Quad., p. 305. 1781.
Didelphis Brunii.	GMEL., Linn. Syst. i. p. 109. 1788.
" "	(Javan Opossum.) SHAW, Gen. Zool., i. Pt. 2, p. 480. 1800.
Macropus veterum.	LESSON, Manuel de Mamm. p. 227. 1827.
" *Bruinii.*	FISCHER, Syn. Mamm., p. 283. 1829.
Didelphis Brunii.	QUOY et GAIM., Voy. de l'Astrolabe, Zool. p. 116, Pl. 20. 1830.
Hypsiprymnus Brunii.	MÜLLER, Zoogd. der Indesch. Archipel. Pt. 4, Pl. 21, Head, Pl. 22, fig. 3; Skull, Pl. 23, figs. 7 and 8, and Pl. 24, fig. 7; Bones of the hind leg, figs. 8 and 9. 1841.
Halmaturus Asiaticus.	GRAY, in List of Mamm. in Brit. Mus. p. 91. 1843.

Head narrow, and very long; ears short; tail moderate; fore legs strong: fur very short, soft, and composed of hair almost entirely of one kind, radiating from a point on the mesial line of the back a little behind the shoulders; general colour greyish brown suffused with yellowish, especially on the sides of the body; under parts pale dirty yellow: ears blackish externally.

Inhabits New Guinea.

This singular animal is the first of the Kangaroo family with which naturalists became acquainted, being imperfectly described, but better figured, as early as the year 1711, by Le Brun; its characters were subsequently more carefully

pointed out by Pallas, and it is upon the accounts of these two authors that all the various descriptions and notices in systematic works,[1] chiefly under the specific names *Filander* and *Brunii*, have been founded until a comparatively recent period. Several specimens of the Filander were seen, in a state of captivity, at Batavia, by Le Brun; these, however, must have been transported from New Guinea, whence it has since been procured during the French expedition of the Astrolabe, and still more recently by the naturalists of an expedition sent out by the Dutch Government, an expedition which has added much to our knowledge of the natural history productions of the islands in the Indian Archipelago. One of the specimens of this last mentioned expedition is now in the British Museum, and enables me to give an original description. The dimensions of this specimen are as follows:—

	Inches.	Lines.
Length from the tip of the nose to the root of the tail	29	3
" of tail	18	3
" of tarsus	6	0
" from nose to ear	5	1
" of ear	1	10
" of fore leg, from elbow to ends of fingers	7	6

The Filander, like the Tree-Kangaroos, has the fur radiating from a point rather behind the shoulders, and the hair on the neck directed forwards as in those animals. The fur is remarkably short, rather soft, and has very little gloss; on the crown of the head the hairs have their points directed inwards and backwards, and there meeting the hairs of the neck, which have the points directed forwards, a small tuft is formed at

[1] Desmarest must be excepted, he having described a very distinct species (*Macropus Ualabatus*) under the name *Macropus Brunii*, supposing that it was identical with the New Guinea animal.

their point of junction, which is on the back of the head. The general tint of the animal is brown, by no means dark, and slightly inclining to grey-brown on the back; the sides of the body are of a somewhat brighter colour, being slightly tinted with yellowish; the whole of the under parts, as well as the fore legs and feet, are of a dirty yellowish white; the hind legs are of the same tint externally as the sides of the body, but paler on the inner sides; the tarsi are of an uniform palish brown. The ears are rather small, and rounded at the tip, clothed externally with short and almost velvet-like black hairs; on the inner side of the ears are but few hairs, and these are greyish. The tail is well clothed with short and soft hairs, brown on the upper surface, and brown-white beneath; on the sides of the tail, the hairs, instead of pointing backwards as usual, are directed upwards; the tip of the tail is almost destitute of hair, (apparently worn off by friction,) and exhibits the scales very distinctly. The head is of a pale brown colour, and the muffle is naked.

In the large size of the premolar tooth, and in the possession of a distinct canine, *Macropus Brunii* approaches the *Hypsiprymnus* group, in which it has been arranged by Dr. Müller, and the elongated form of its skull would lead one to compare it with the *Hypsiprymnus minor*, but although the skull is elongated in both instances, there are many important differences observable in its structure when the two are compared. The zygomatic arch is deeper and longer than in *H. minor*, and the orbit is more advanced; the nasal bones terminate in a line with the anterior boundary of the orbit, whilst in *H. minor* the root of the nasal bones is situated considerably in advance of the same point. In the structure of the intermaxillary bones, of the true molar teeth, (judging from Dr. Müller's figures) and of the auditory bullæ, *M. Brunii* is conformable with the Macropus type, and to these points, which separate *M. Brunii* from *Hypsyprymnus*,* we

may add the structure of the anterior extremities. On the other hand, in the peculiar form of the nasal bones, which are contracted in the middle, and expanded almost equally at each extremity, and the broad interorbital space, the *M. Brunii* evinces an affinity with the Tree-Kangaroos (*Dendrolagus*) which inhabit the same country. This affinity is also indicated in the comparatively large size of the premolars (if the dotted lines in Dr. Müller's figures indicate the size and form of these teeth correctly), and in the presence of canine teeth. In *Dendrolagus*, moreover, we find the zygomatic arch narrow in the vertical direction, as compared with the true Kangaroos, and in this respect they agree with *M. Brunii*, as well as in the form of the lower jaw, which has the angle much less raised than usual; indeed the skull of a Tree-Kangaroo, if more elongated, would more nearly resemble that of *M. Brunii*, than any other species of the *Macropodidæ*. The upper incisor teeth are remarkably small, and the posterior incisor apparently has no external vertical groove in *M. Brunii*, and an approach to this animal is further evinced in the Tree-Kangaroos, in the structure of these teeth, and more particularly in the *Dendrolagus ursinus*. Lastly, I may notice that the fore legs are comparatively large in *M. Brunii*, and that the hairs radiate from a centre, in the back of the neck, in the same way as in *Dendrolagus*. The animal under consideration, however, I must observe, differs from the species of *Dendrolagus* in having the muffle naked, and in possessing tolerably long posterior palatine openings to the skull. The dimensions of the skull of *M. Brunii*, taken from Dr. Müller's figures, are as follows:—

	Inches.	Lines.
Length of skull	5	2
Width	2	2
Length of nasal bones	1	11
Width at base	0	5¼
Width near apex	0	4½

	Inches.	Lines.
Width of interorbital space	0	11
Length of palate	2	9
" of three incisor teeth, of either side of upper jaw, taken together ...	0	4
" from incisors to canine	0	5
" of canine	0	1
" from canine to molars	0	8
" of premolar	0	6¼
" of the four true molars	1	0½
Width of palate between the foremost molars	0	9
Length of posterior palatine openings about	0	6½

Genus, *Dendrolagus*[1].

Dendrolagus. Müller, Verhandelingen over de Nateurlijke geschiedenis der Nederlandische overzeesche bezittingen.

Kangaroos with the anterior extremities large and powerful, being but little inferior in size to the posterior extremities; the claws of the fore feet very large, curved, and pointed; those of the two principal toes of the hind feet somewhat compressed, and curved; the hind foot, tibia, and femur, nearly equal in length: muffle clothed with small hairs as far forwards as the anterior angles of the nostrils: tail long, cylindrical, and somewhat bushy. Skull with the interorbital space broad; the nasal bones short, contracted in the middle, and expanded at both extremities; the zygomatic arch but little prominent, and with but a small vertical diameter; the palate almost destitute of posterior openings; the lower jaw with the angle but little raised; the three upper incisor teeth of nearly equal size, and the hindermost of these teeth apparently without any external vertical groove; the premolar large; a canine tooth present in the upper jaw, but of small size[2].

[1] From δένδρον, a tree; and λαγος, a hare.

[2] The characters derived from the skull and dentition are gleaned from the drawings given in the great Dutch work upon the productions of the Islands of the Indian Archipelago, above quoted; the author has not had an opportunity of examining the skulls themselves.

Two species of this section are known, both of which inhabit New Guinea, and are said to ascend the trees, for which habit their strong fore legs, added to the curved and powerful claws, are adapted.

The *Phalangistidæ* in their skull and dentition approach the Kangaroo group in such a manner, that one would be inclined to regard the two families as furnishing arboreal and ground types of a large natural division, and to suppose, in fact, that the Phalangers might, without impropriety, be looked upon as tree Kangaroos; it is interesting, however, to observe that in the Dendrolagus section we have examples of species which, although their extremities are modified to enable them to ascend trees in quest of their food, are strictly conformable to the Kangaroo type in all essential parts of their structure, and do not evince any very direct affinity to the *Phalangistidæ*—any such approach, in fact, as would lead us to regard them as a link between the Phalangers and Kangaroos; it is, indeed, in certain species of the *Hypsiprymnus* group, that we find the nearest approximation to the *Phalangistidæ*, in the structure of the skull and teeth, and even in the possession of a prehensile power in the tail.

DENDROLAGUS URSINUS. Ursine Tree-Kangaroo.

(*Plate* 1.)

Dendrolagus ursinus. Müller, Zoogdieren der Indischen Archipel. Pt. 4, Plate 19; head, Pl. 22, fig. 1; skull, Pl. 23, fig. 1—3, and Pl. 24, fig. 1; bones of hind legs, figs. 2 and 3.

" " Gould, Monograph of the Macropodidæ, Pt. 2, Plate 11.

Head conical; ears short; fur long, coarse, and glossy black: the hairs of the neck directed forwards, and meeting those of the head, which have the usual direction, form a transverse crest

between the ears, which are densely clothed with very long hairs, black, excepting at the point, where they are of a deep brown hue: head clothed with short hairs; yellowish brown: of a deeper brown hue around the eye, and on the muzzle; cheeks brown-yellow; under parts of body brown, also clothed with short hairs: tail very long, densely clothed with moderately long, and very harsh black hairs, but around the base they have a deep brown hue.

Inhabits New Guinea.

This animal has received the specific name *Ursinus* no doubt on account of a certain superficial resemblance which it has to a small bear, arising in a great measure from the nature of its fur, which differs much from that of the ordinary Kangaroos, not only in being harsh and glossy, but in being composed of one kind of hair only: it would appear that that kind of hair which forms the chief clothing in the ordinary Kangaroos is here entirely, or almost entirely, wanting, and that the hairs representing the longer interspersed hairs in the fur in those animals, here forms the entire coat. With all the essential characters of the true Kangaroos, we find, in these tree-climbing animals, the limbs modified for their different mode of life—the long hind legs of the Kangaroo proper, are replaced by comparatively short legs, and the fore legs are but little inferior in size to the posterior limbs; the strong fore feet are armed with stout and long claws, compressed, and much curved, and fitted for clinging to the inequalities of the bark of the trees. The enormously long tail no doubt helps to balance the animal whilst on the branches of the lofty trees which it ascends in quest of food.

The hairs on the back average about an inch and a half in length; those on the head, as far back as the ears, and on the whole of the under parts of the body, are short; on the tail, which is densely clothed throughout, they are very harsh, and by no means decumbent; they average perhaps at about half

an inch in length, or rather less; the tail gradually tapers from the base to the apex, and is about two inches in diameter (including the hair) at the former part, and three-quarters of an inch at the distal extremity. On the upper parts and sides of the body, as well as the limbs (excepting at the base internally), the fur is black and glossy, and very nearly uniform to the skin, an indistinct brownish hue being only observable quite at the root of the hairs. The tail is black, but tinted with brownish at the root. The ears are densely clothed with very long hairs, which completely conceal them; the hairs springing from the tip of the ear are brown, but the rest are black. The head in front of the ears, and the whole of the under parts of the body, are brown, but varying in intensity in parts, being darker around the eye and on the muzzle, and yellowish on the cheeks; the belly is also yellowish, whilst the chest assumes a deeper hue. The muffle appears as if naked, but has, in fact, very minute hairs scattered throughout: the hair on the muzzle, above, is very short. The fore legs are very strong, and so are the hands and the claws with which they are provided;—the claw of the middle finger being at least three-quarters of an inch in length. The hind feet are strong, but comparatively short: the largest toe has the nail an inch in length, strong, somewhat compressed and curved. The toes are less unequal in size than in the typical Kangaroos; the end of the claw of the outer toe terminates in a line with about the middle of the great central toe, and the nails of the double inner toe extend about $\frac{1}{12}$ of an inch beyond the base of the central one.

The specimen from which the above description is taken is a female, and forms part of the British Museum collection; its dimensions are as follows:—

	Inches.	Lines.
Length from tip of nose to root of tail ...	20	6
" of tail	23	9
" of tarsus	4	10
" from tip of nose to ear	3	6
" of ears	1	3
" of fore leg (from elbow joint to the end of the nails)	7	3
Length of skull[1]	4	2
Width of ditto	2	$2\frac{1}{2}$
" " between orbits	0	$10\frac{1}{2}$
Length of nasal bones	1	4
Width of ditto behind	0	7
" " near the apex	0	$5\frac{1}{4}$
Length of zygoma	2	$5\frac{1}{2}$
" from anterior root of zygoma to apex of intermaxillaries	1	$4\frac{3}{4}$
" of the three upper incisors taken together	0	$4\frac{1}{8}$

DENDROLAGUS INUSTUS.

Brown Tree-Kangaroo.

Dendrolagus inustus. Müller, Zoogdieren van den Indischen Archipel. Pt. 4, Pl. 20 ; head, Pl. 22, fig. 2 ; skull, Pl. 23, figs. 4—6, and Pl. 24, fig. 4 ; bones of hind leg, figs. 5 and 6.

" " Gould, Monograph of the Macropodidæ, Pt. 2, Pl. 12.

Fur rather long, and somewhat harsh ; brown, pencilled with brown-white ; under parts of head and body impure white, fore and hind legs brown-white ; feet dusky brown.

Inhabits New Guinea.

This species is about the same size as *D. ursinus*, from which it differs not only in being of a brown colour, but in

[1] These dimensions are taken from the figures in the Plates of Dr. Müller's work, already quoted.

having the muzzle and tarsi rather more elongated, and the ears less densely clothed with fur: the hairs of the back do not so distinctly radiate from a point, rather behind the shoulders, as in *D. ursinus;* over the shoulders, however, the points of the hairs are directed outwards, and on the back part of the neck they are directed forwards, but are semi-erect, and those of the head are directed backwards. The fur is rather less harsh than in *D. ursinus;* its general hue is deepish brown on the upper parts of the body, but here each hair is brown at the base, shaded into brownish black externally, whilst at the point they are of a very pale brown colour, inclining to white; on the under parts of the body the exposed portions of the hairs are white, or very nearly so, but in the middle they are of a very pale brown colour, and at the base still paler, and nearly white in some parts. The sides of the head are of a pale brown colour, and the upper surface is dusky brown. The muzzle is clothed with very short hairs. The ears are tolerably well clothed with longish hairs, brown on the inner side, and dusky on the outer: the fore arms and hind legs are brownish white, but the hairs on these parts are brown at the root: the hinder part of the haunches is whitish, and so is the tail beneath at the base; this member is well clothed with longish, harsh hairs, partly brown-white, and partly pale brown; its general hue is paler than that of the body. The fore and hind feet are dusky brown, but pencilled with whitish on the hinder parts.—From the Paris Museum.

	FEMALE. Inches.	Lines.
Length from tip of nose to root of tail ...	27	0
" of tail	25	0
" from nose to ear	4	2
" of ear	1	6
" of fore-arm and hands without the nails	6	8
" of the nail of the middle finger ...	1	6
" of tarsus without the nails	4	7
" of the nail of the central toe ...	1	1

	Inches.	Lines.
Length of skull[1]	4	$3\frac{1}{3}$
Width of ditto	2	$3\frac{2}{3}$
" between orbits	0	11
Length of nasal bones	1	$6\frac{1}{2}$
Width at base	0	7
" near the apex...	0	$5\frac{1}{4}$
Length of zygoma	2	$2\frac{1}{2}$
" from anterior angle of zygoma to apex of intermaxillaries	1	$3\frac{1}{4}$
" of the three upper incisors taken together	0	$5\frac{2}{3}$

The skull, it would appear, in *Dendrolagus inustus*, is broader than that in *D. ursinus*, the zygomatic arch deeper, and the superior incisor teeth broader. According to the figures of the leg bones given in Plate 24 of Müller's work, the tibia is rather shorter than the femur in *D. ursinus*, whilst in *D. inustus* the femur is the shorter of the two bones.

The author is not aware that any detailed account of these two singular animals has yet appeared; the only notice he has met with is the portion of the great work on the Dutch possessions in the Indian Archipelago, which treats of the general features of New Guinea, and of the natives.—(See Bijdragen tot de Kennis Van Niew Guinea). Here will be found a short description of the two species of *Dendrolagus*, and with respect to their habits, Dr. Müller merely observes that they live in the trees.

Genus *Hypsiprymnus*.

Macropodidæ with a distinct canine tooth in the upper jaw; the anterior upper pair of incisors descending considerably below the level of the remaining two pairs; the premolar long

[1] According to the figures given by Dr. Müller.

(sometimes as long as the anterior two true molars taken together), compressed, and presenting a cutting edge, the outer and inner surfaces with small vertical grooves; the true molars successively decreasing in size from the foremost to the hindermost; their crowns nearly square, and divided by a transverse and a longitudinal groove into four blunt tubercles; auditory bullæ large, and as it were inflated; zygomatic arch with a small vertical diameter: toes of the fore feet armed with very long, compressed, and but slightly curved solid claws; the two lateral toes much shorter than the others, and with the claws small in proportion.

Whilst the œsophagus terminates in the middle division of the stomach in the true Kangaroos, in the Rat-Kangaroos (Prof. Owen states) it is removed from the commencement of the middle sacculated compartment to its termination[1]. The cœcum is much shorter than in the great Kangaroos.

The Rat-Kangaroo, or Potoroos, are all of small size, as compared with most other species of the Kangaroo family, being, for the most part, about equal in bulk to the Common Hare or Rabbit. Their body is of a more compact form, the fore parts being less elongated; and the ears being small and rounded, gives them a different aspect, when compared with the typical Kangaroos; but some of the smaller species of *Macropus* could not be distinguished from the Rat-Kangaroos in these respects. In external characters, one of the most striking points of distinction is in the structure of the fore foot, the toes being more unevenly developed in the Rat-

[1] Todd's Cyclopædia of Anatomy, &c. iii. p. 301. "The stomach is as singularly complicated as in the Kangaroos, and the complication is essentially the same in both, arising from the sacculation of the parietes of a very long canal, by a partial disposition of shorter bands of longitudinal fibres; but in the Hypsiprymni this sacculation is confined to that part of the stomach which lies to the left of the œsophagus, while the right division of the cavity has the ordinary form and structure of the pyloric moiety of a simple stomach. The left cardiac division is enormously developed; in relative proportion, indeed, it is surpassed only by the true ruminant stomachs."—Owen, loc. cit.

Kangaroos,—the three central toes proportionately longer than we find them in *Macropus*, and the lateral toes smaller; the nails, moreover, are of a different form: in *Macropus* they are broadest, and concave beneath, whilst in *Hypsiprymnus* they are much compressed, solid, and broadest above. These differences, observable in the structure of the fore foot and claws, are connected with certain differences in the habits of the species of the two divisions. Whilst the true Kangaroos browse upon the herbage, the Rat-Kangaroos, we learn, feed much upon the roots of certain plants, which they scratch up with their fore feet. In the hind feet no constant difference is perceptible. In the structure of the skull and teeth there are many differences worthy of remark:—The frontal bones are larger in *Hypsiprymnus* than in *Macropus;* the muzzle is more compressed, and more pointed at the extremity; the zygomatic arch is much more slender, its vertical diameter being considerably less; the pterygoid processes are less developed; the intermaxillary bones are less produced: a vertical line dropped from the tip of the nasal bones, in the animals under consideration, would, in most species, very nearly touch the front edge of the foremost incisor, but the same tooth in Macropus would be found advanced considerably beyond the corresponding line. The auditory bullæ, which, as Prof. Owen has pointed out, are, in almost all the Marsupialia, formed by the expansion of the great alæ of the sphenoid, and not by a portion of the temporal bone, as in the Rodents, here assume a hemispherical form. I have not met with this, as it were, inflated auditory chamber, in any of the species of the *Macropus* division, excepting in the *Lagorchestes leporoïdes* and the *L. conspicillatus*[1]. With

[1] Since my account of the species *Lagorchestes* was printed, I have had an opportunity of examining a skull of the *L. conspicillatus*, contained in Mr. Gould's collection: this differs much from the skull of *L. leporoïdes*. The muzzle is shorter and broader, the zygomatic arch does not project so suddenly

regard to the upper incisor teeth, the differential characters are, that they are proportionately smaller, less compressed from the outer to the inner side; the foremost pair descend much below the level of the other two pairs, and these latter pairs are not so widely separated from each other as in *Macropus*, owing to the contraction of the palate between them. The canine teeth are always present, and usually pretty well developed; they are very small, however, in

in front, and above all it differs in its great strength, the bones being thicker in proportion than in any of the species of Macropodidæ I have met with: the temporal ridges meet, and form a distinct sagittal crest: the palate is remarkable for presenting four posterior palatine openings, two of which are nearly round, and situated entirely in the palatine bones, and are rather more than 1½ lines in diameter; the other pair are oblong, of about the same size, and are placed at some little distance in advance of the palato-maxillary suture. The canine tooth is more developed than usual, and in this character, as well as in having the auditory bullæ prominent, the *L. conspicillatus* approaches *Hypsiprymnus*; the premolar is moreover large for a *Macropus*, though smaller than in *Hypsiprymnus*. The foremost upper pair of incisor teeth are very much larger than the other two pairs; the palate, however, is not contracted between the lateral pairs of incisors, as in *Hypsiprymnus*; and the structure of the true molar teeth, the great depth of the zygomatic arch, the small size of the frontal bones (which are considerably contracted between the orbits), combined with the structure of the fore feet in the animal, all tend to show that its more direct affinity is with *Macropus*. The dimensions of this skull are as follows:—

	Adult Male. Inches.	Lines.
Total length of skull	3	4
Width	2	0½
" between orbits		7¼
Length of nasal bones	1	4
Width of ditto behind		7½
" " near the apex		4¾
Depth of zygomatic arch behind		5½
Length of the three upper incisors, taken together		4
Distance between posterior incisors and premolar		5
Length of the five molar teeth, taken together	1	1½

Hypsiprymnus campestris: the premolar tooth is larger, and almost always has numerous distinct vertical grooves both on the outer and inner sides. The true molar teeth differ, in being successively smaller from the foremost to the last, and the crowns of these teeth have the two principal transverse ridges much less developed. A more accurate idea of the structure of the unworn grinding surface of the molar tooth of a *Hypsiprymnus* (see Plate 10, figs. 5 and 5 *a*) would be conveyed by describing them as of a quadrate form, and presenting four equidistant blunt tubercles, which are joined in pairs by transverse ridges, but with these ridges less elevated than the points of the tubercles: there is a slight trace of the band of the tooth both on the front and back of each molar, as in *Macropus*. The hindermost molar is generally small, and sometimes almost round[1].

On Plates 6, 8, and 10, are represented the skulls of the various species of Hypsiprymnus, or Rat-Kangaroos. Since the last tooth to make its appearance in these animals is the permanent premolar, it very frequently happens that the skulls in collections do not show this tooth. At different ages previous to the animals having attained maturity, the skull will present two molars belonging to the milk, or first series, and from one to a perfect series of the true molars. When all the true molars are just developed, and there are six molars on each side of either jaw, it will be found that the foremost of each row corresponds almost perfectly in structure with the permanent premolar, excepting that it is of rather smaller size; and the second tooth, which resembles a true molar, excepting in being rather smaller, are teeth of the first series; for they will be replaced in the vertical direction by another tooth, and this is the permanent premolar. The skulls, figs. 2 and 4, of Plate 10, belonging to animals which were not quite adult, present the condition of

[1] Cases occur in which the last molar tooth is absent; and, what is more extraordinary, I have observed an extra molar tooth on each side of the upper jaw, in a species of *Hypsiprymnus*.

the teeth just described; and to show the size and form of the permanent premolar, it has been necessary to remove a part of the bone from the outer side of the jaw. Fig. 2 *a*, and fig. 4 *a*, represent the fore part of the upper jaw, in which is seen the three incisors, followed by the canine, and then by two milk teeth, above which milk teeth is the permanent premolar (*), which, as it grows, thrusts out the two milk teeth, and assumes their place, as in the adult skull, fig. 3 *a*.

The letters added to the figures in Plate 8 may here be explained:—

a, is the occipital bone.
b, the interparietal bone.
d, the temporal bones.
c c, the sphenoid.
d', expanded portion of the great ala of the sphenoid, forming the auditory bulla.
e e, parietal bones.
f, palatine bones.
f' f', posterior palatine openings.
g g, frontal bones.
h h, lachrymal bones.
i i, malar bones.
k k, nasal bones.
l l, maxillary bones.
l' l', palatal portion of the maxillary bones.
m m, intermaxillary bones.
in. incisor teeth.
ca. canine.
p-m. premolar.

Of the lower jaw (figs. 2 *a*, and 3 *b*.)

A, is the horizontal branch, or ramus.
B, the ascending ramus.
1, the coronoid process.
2, the condyloid process.
3, the angular process.
i, the incisor tooth.
p-m, the premolar.
m, the four true molar teeth.

The Rat-Kangaroo[1] may be subdivided into three minor groups, two of which have received names; the third contains the *Bettongia rufescens* of Mr. Gray, which I shall proceed to describe.

Section, or *Sub-Genus*, 1.

Muffle almost entirely clothed with hair; bony palate without posterior openings; tarsus long.

HYPSIPRYMNUS (Sect. 1) RUFESCENS.

The Rufous Rat-Kangaroo.

Bettongia rufescens. GRAY, Magazine of Natural History for Nov. 1837, vol. i. p. 584.
Hypsiprymnus melanotis. GOULD, Monogr. Part 2.
,, ,, OGILBY, Proceedings of the Zool. Soc. for May, 1838, p. 62.

Fur moderately long and soft, the interspersed harsher hairs long: general tint bright rusty red, but much pencilled with whitish; under parts impure white; ears with white hairs internally, excepting at the margin, where they are rusty red; externally, densely clothed with soft black hairs; fore legs and feet white, or nearly so; tarsi dusky brown: tail moderately well clothed, the hairs adpressed, and tolerably long on the apical portion; of a dirty white colour, but rather finely pencilled with dusky on the upper surface at and near the base: muffle clothed with small hairs, but with a narrow naked space next the nostril openings.—Skull, Plate 10, fig. 1.

Inhabits New South Wales.

[1] The animals in question are usually called Kangaroo-Rats; but as they belong to the Kangaroo group, and not to the Rat tribe, I think all will agree in the propriety of the above alteration of the relative position of the two terms.

Hypsiprymnus rufescens is one of the largest species of the Rat-Kangaroos; and, as the names which have been given to it imply, is remarkable for the red hue of its fur, and the black colour of its ears; the black, however, it must be observed, is confined to the back of the ear. It not only differs from its congeners in size, and the colouring of its fur, but may be distinguished by its having the muffle nearly covered with fine velvet-like hairs, these extending nearly as far forward as the anterior angle of the nostrils; there is, however, a naked space around each nostril opening.

Mr. Gould informs us that this species is very common in New South Wales, inhabiting the but little elevated stony ridges, especially in those parts in which shrubs and grasses abound. It appears, observes this gentleman, to be dispersed over the whole of the colony, from the coast to the interior highlands. Its nest is composed of grasses, and is frequently placed under the shelter of a fallen tree, or at the foot of some low shrub. During the day the little animal lies coiled up in its nest, but it occasionally reposes in a "seat," like the Hare-Kangaroo (*Lagorchestes*), but it never sits in the open plains. On being pursued, it runs with great swiftness for a short distance, but from the circumstance of its invariably seeking shelter in the hollow logs, it falls an easy prey to the natives, who seek it for food. Its food consists, like others of the genus, of various kinds of roots and grasses.

Messrs. Ogilby and Gray both drew up their original descriptions of the present species from a specimen contained in the Museum of the Zoological Society, which presents the following characters:—

Fur long, loosely applied to the body, and having numerous very long and coarser interspersed hairs, the visible portion of which is chiefly white; each of these hairs, however, is black at the point, and has a rusty red space immediately below the black portion; the shorter hairs have the

visible portion bright rusty red, and all the hairs on the upper parts and sides of the body are grey at the root; on the under parts of the body the hairs are white (not very pure), and slightly tinted with grey at the root. The head presents but little of the red tint; on the cheeks, immediately below the eye, the hairs are very coarse, and tinted with white, red, and black; the upper part of the muzzle is brownish: the ears are clothed internally with long whitish hairs, excepting at and near the margin, where they assume a rust colour; on the outer side of the ear they are dense, long, and soft, and of a black colour, but at the margin they are shorter and whitish. The fore legs are whitish, rather strong, and the hands are furnished with long whitish claws. The tarsi are clothed with glossy brown hairs. The tail is chiefly of a dirty white colour; on the upper surface variegated with dusky, but chiefly at the base; the hairs are moderately long (averaging about half an inch), and sufficiently numerous to hide the skin; they are rather harsh to the touch on the upper part of the tail, and very coarse on the under surface: though towards the tip of the tail the hairs are rather longer than on the middle, they do not form any crest or brush, as in *Hypsiprymnus penicillatus*, and some other Rat-Kangaroos. Of the subjoined dimensions, those contained in the first column denote the size and proportions of the specimen above described; and those in the second column are from a specimen in the British Museum collection:—

			Male.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	19	0	20	0
" of tail	14	9	16	0
" of tarsus and claws	5	8	5	9
" of ear	1	8	1	8
" of fore legs, hand, and claws, about			4	0

The skull of *B. rufescens* differs from the cranie of other species of the genus, in wanting the posterior palatal

openings, which are generally so large; here the palatine bone is of a square form, and the palato-maxillary suture crosses opposite the interspace of the second and third true molar teeth; at the anterior angles of the palatine bone is a minute perforation. The skull, moreover, is remarkable for its breadth, and for the shortness of the facial portion, and consequently of the nasal bones, and of the interspace between the premolar tooth and the incisors. The palatal interspace between the hinder pair of incisors is much contracted, being not more than three-quarters of a line in width, and this contraction is owing to the comparative great transverse diameter of the teeth in question. The palate is broad and concave; the zygomatic arch comparatively deep, measuring towards the hinder part about four lines from the upper to the lower edge.

Although the skull has not been removed from the skin of the specimen of *Hypsiprymnus rufescens* in the Zoological Society's museum, I have been enabled to make one or two admeasurements of the foremost teeth, and of the distances between them; and these I have added in the second column, —the first giving the dimensions of an imperfect cranium contained in the Royal College of Surgeons' museum.—See Plate 10, fig. 1.

	Inches.	Lines.	Inches.	Lines.
Length from the posterior root of the zygomatic arch to the apex of the intermaxillary bones	2	7½		
" of the zygomatic arch	1	6		
Width of skull	1	11		
Length of nasal bones	1	2		
Width of ditto at the base	0	7½		
" " near the apex	0	4		
Length of the three incisors of upper jaw, taken together	0	4¼	0	4
" from posterior incisor to canine ...	0	1⅓	0	1½
" from canine to premolar ..	0	1¼	0	2
" of premolar (the milk tooth) ...	0	3¼		

	Inches.	Lines.	Inches.	Lines.
Length of ditto and three molar teeth together (the foremost molar being a milk tooth)	0	11¼		
" of palate	1	8		
Width *of ditto between the premolar teeth*	0	8		
" *of interorbital space*	0	6¾		
Length of permanent premolar	0	4⅛	0	4½
Height of lower jaw, measuring from apex of coronoid process	1	1¾		
Distance between hinder part of condyle and anterior margin of coronoid process, measuring in a horizontal line			0	8⅔

Sub-genus 2. *Bettongia.*

Bettongia. GRAY, Magazine of Nat. Hist. Vol. i. (New Series), p. 584.

Muffle naked; tarsus long.

The tail is generally provided with longish hairs on the upper surface of the apical portion, forming a bushy crest on this part, in the species of this section, some of which (if not all) have a prehensile power in the tail; the prehensile power, however, is apparently very limited, for the organ in question is not capable of being used, as in the Phalangers, and some other Marsupials, for sustaining the weight of the body.

HYPSIPRYMNUS (*Bettongia*) CUNICULUS.

Tasmanian Rat-Kangaroo.

Hypsiprymnus cuniculus. OGILBY, Proceedings of the Zoological Society for May 1838, p. 63; WATERHOUSE, Marsupialia, p. 186.

Bettongia setosa. GRAY, Magazine of Nat. Hist. vol. i. (New Series), p. 584; List of Mammalia in the collection of the British Museum, (1843), p. 93.

Bettongia cuniculus, Tasmanian Jerboa Kangaroo. GOULD, Monogr. on the Macrop. Part 2, 14th Plate.

Fur moderate, of an ashy brown colour, pencilled with whitish; on the under parts of the body dirty white: ears with pale

yellowish hairs internally, pale brown externally; feet brown-white: tail palish brown above, brown-black at the apex, where there are longer hairs, forming a bushy crest on the upper surface; under parts of tail brown-white. The extreme point of the tail sometimes white, if not always so.—Skull, Plate 10, fig. 2.

Inhabits Van Diemen's Land.

The original of Mr. Ogilby's description of *Hypsipr. cuniculus*, contained in the museum of the Zoological Society, is said to have come from New South Wales, but it is possible there is some mistake as regards this habitat, since Mr. Gould, in his visit to Australia, found the species in Van Diemen's Land only. That gentleman informs us, that it is generally distributed over the island, and prefers the open sandy, or stony forest land, rather than the thick and humid brushes. It is the largest of the Rat-Kangaroos, and in general colouring resembles the *H. penicillatus*; it is not only distinguished, however, by its superior size, but by its having a white tip to the tail. The proportions of the crania of the two animals differ considerably.

The *H. cuniculus* of the Zoological Society's collection has the fur moderate as to texture, and tolerably long; the general tint of the animal is grey-brown, but the hairs on the upper parts of the body are rather broadly annulated with dirty rusty white towards the point, and dusky at the point—next the skin, or at the root, they are grey: the under parts of the body are dirty white; the ears are clothed with very pale yellowish hairs internally, and more densely clothed with pale brown hairs externally: the feet are of a very pale brown colour, or might be described as brown-white: the tail is brown above, and brown-white beneath; on the upper surface of the apical portion the hairs are longish, averaging nearly three quarters of an inch, and of a brown-black hue; these

bushy hairs extend for about two inches from the end of the tail.

The extreme point of the tail is perhaps wanting in this specimen; for in a specimen in the British Museum in which the tail is perfect, about one inch of the apical portion is white. A second specimen has the tail somewhat suffused with rust colour, and the apical third is clothed with bushy brown-black hairs above—the point is wanting. This latter specimen is the original of the *B. setosa* of Mr. Gray, alluded to in the Magazine of Natural History, having been regarded by that gentleman as the *Hyps. setosus* of Mr. Ogilby—a very distinct species. The dimensions of this specimen are given below in the second column, whilst those of the *B. cuniculus*, of the Zoological Society, are contained in the first column:—

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	17	6	16	0
" of tail	13	0?	12	0?
" of tarsus and claws	5	0	5	0
" of ear	1	2	1	2

Fig. 2, of Plate 10, is taken from a skull of the *B. cuniculus* in the Museum of the Royal College of Surgeons. It was procured by Mr. Gould in Van Diemen's Land. The skull of the specimen originally described by Mr. Ogilby differs in having the nasal bones a trifle broader behind, and distinctly narrower in front, and the inter-orbital space rather broader. Its dimensions are given in the first column, whilst those of the specimen figured (which is fractured behind) are contained in the second column:—

	Zool. Soc. Inches.	Zool. Soc. Lines.	Coll. Surg. Inches.	Coll. Surg. Lines.
Total length of skull, about	?		3	4
" width			1	10$\frac{1}{3}$
Length from tip of nasal bones to hinder margin of frontals	2	6	2	6
" of nasal bones	1	4$\frac{1}{2}$	1	4$\frac{3}{4}$
Width of ditto at base	0	8	0	7
" " near the apex	0	3$\frac{1}{2}$	0	4

	Zool. Soc. Inches.	Zool. Soc. Lines.	Coll. Surg. Inches.	Coll. Surg. Lines.
Width of inter-orbital space	0	$9\frac{3}{4}$	0	$9\frac{1}{4}$
Length of three upper incisor teeth, taken together	0	4	0	$4\frac{1}{5}$
Distance between incisors and canine tooth	0	1	0	$\frac{3}{4}$
" canine and premolar ...	0	$3\frac{3}{4}$	0	4
Length of permanent premolar	0	$3\frac{9}{10}$	0	$3\frac{9}{10}$
" of the premolar and four true molars, taken together			1	$0\frac{1}{4}$

HYPSIPRYMNUS (*Bettongia*) GRAII.

Gray's Rat-Kangaroo.

Hypsiprymnus Graii. GOULD, Proceedings of the Zoological Society for December, 1840, Pt. 8, p. 178; WATERHOUSE, Marsup. p. 190.

Hypsiprymnus Lesueuri (?) QUOY et GAIMARD, Voyage de là Coquille.

Fur ashy grey, pencilled with white, or brown, pencilled with rusty white; under parts pale yellow: tail rusty brown above, assuming a deepish brown hue towards the apex; usually about two inches of the apical portion white; tarsi brown-white, or very pale rusty brown: head usually suffused with yellow, especially on the sides; foremost pair of incisor teeth rather broad, not compressed. Skull, Plate 10, fig. 3.

Inhabits Western and Southern Australia.

The present species of Rat-Kangaroo, which is named in honour of Mr. Gray, head of the Zoological Department of the British Museum, inhabits both the Western and Southern districts of Australia, and in both districts is associated with the *H. penicillatus* (or at least with the *H. Ogilbyi*, which I regard as a variety of that animal).

Many specimens of *H. Graii* have come under my notice, and although these exhibited considerable variation in their colouring, and sometimes approximated very closely to other species, yet, with the assistance of the skull, I have found no difficulty in distinguishing them. Some individuals might be confounded with the *H. Gaimardi*, and others again approxi-

mate very nearly to the *H. penicillatus:* the broader form of the anterior pair of incisors, however, will help, in combination with other characters about to be noticed, to distinguish the *H. Graii* from either of those two species. The skull is proportionately broader, the auditory bullæ larger, the pre-molar tooth larger, and placed nearer the canine, than in *H. penicillatus:* the auditory chambers are much larger, and the interorbital space is more contracted, than in *H. Gaimardi.* Other points of distinction will be perceived in the proportions of the skull and teeth upon comparing the dimensions, hereafter given, with those of the crania of the species just mentioned.

The following is a description of an adult male specimen in the British Museum, which formed part of Mr. Gould's collection, and which, I believe, is the original of that gentleman's description in the Proceedings of the Zoological Society; if so, it is from the Swan River district.

Fur moderately long, and soft: general tint brownish ash colour, but pencilled with white and blackish; under parts dirty white. Ears externally clothed with long hairs of a brownish white colour, but tipped with brown; internally with shorter hairs, of a palish yellow colour, but brown on the margin of the ear. Feet brown-white, or very pale brown. Tail clothed throughout with adpressed hairs, and these of a rufous brown tint on the upper surface of the tail, and dirty white on the under surface; the apical portion of this organ, however, is entirely white, the white occupying about one-fourth of the entire length. The hairs of the fur on the back are grey at the root, then brownish white; this is followed by a slight rusty red tint, and the points are black. On the under parts of the body the fur is of a pale grey hue next the skin, and impure white externally; on the throat, the hairs are uniformly white. The muffle is small, the hair terminating above in a line with the posterior angle of the nostrils.

		Inches.	Lines.
Length from nose to root of tail	... ...	18	0
" of tail	... ...	12	0
" of tarsi	... ...	4	8[1]
" of ear	... ...	1	0

The following dimensions are from skulls of *H. Graii*, for the loan of most of which I am indebted to Mr. Gould :—

	Old Male.		Male Adult.		Female, Old.		Speci-men in Zool. Soc. Mus. Adult.		Lesueu-ri, Quoy and Gaim.	
	In.	Li.	In.	Li.	In.	Li.	In.	Li.	In.	Li.
Length of skull	3	0½	2	11¼	2	10⅔	2	10	2	11½
Width of ditto	1	10⅛	1	9	1	9½	1	8¾	1	9
Length of nasal bones	1	2¾	1	1⅔	1	2¼	1	0	? 1	3
Width of ditto at the base	0	6	0	6	0	6	0	6⅓	0	6⅓
" " near the apex ...	0	2⅔	0	3¼	0	3	0	3		
Length of frontal bones	1	1⅔	1	1½	1	0			1	0
Width of ditto between orbits ...	0	7¼	0	7½	0	7½			0	8⅔
Length of palate	1	0	1	0	1	0½		?	1	1
" of three incisors on either side of upper jaw ...	0	4	0	3¾	0	4	0	3¾		
Space between incisors and canine ...	0	$0\frac{7}{12}$	0	$0\frac{7}{12}$	0	0¾	0	1	0	1
" between canine and premolar	0	2	0	2½	0	2¾	0	1¾	0	2¾
Length of premolar	0	3¾	0	4	0	4⅙	0	4	0	4¼
Space occupied by premolar and molars on either side of upper jaw	0	11	0	11	0	11	0	11	0	11⅓
Length of auditory bullæ	0	7¾	0	7¾	0	7¾	0	7½	0	7½
Width of ditto	0	6¼	0	5¾	0	6¼	0	6	0	5¾
Height of ascending ramus of lower jaw, in a vertical line dropped from apex of coronoid process ...	1	2	1	0¼	1	1⅓				
Length from back part of condyle to anterior margin of coronoid process	0	8½	0	8	0	8				

[1] The dimension of the tarsus, as given in the volume on Marsupial Animals, in the Naturalist's Library, is incorrect.

The skull of *H. Graii* approaches most nearly to that of *H. Gaimardi*, but differs in being rather broader, in having the auditory bullæ much larger, and the palate shorter—characters pointed out by Messrs. Quoy and Gaimard, as distinguishing, from *H. Gaimardi*, a skull found by them in Dirck Hartog's Island, Western Australia, upon which they found the *Hypsiprymnus Lesueuri*. I may add, that the zygomatic arch is rather deeper, and the anterior pair of incisors are broader, than in *H. Gaimardi*[1]. In a drawing of the skull of *H. Lesueuri*, made at Paris, and kindly lent me by Mr. Owen, I find the anterior part of the cranium is somewhat mutilated, and wants the incisors: hence this latter character was not noticed. Judging from the drawing in question, I can feel scarcely a doubt that the *H. Lesueuri*, and the *H. Graii*, are specifically identical, and if this view be correct the former of these two names should be used. The dimensions in the last column are taken from the drawing referred to. The skull, of which the dimensions are given in the first column, is remarkable for possessing five true molar teeth, the last of which is very small—less than one line in diameter. In the skull in question, the permanent premolar is perfectly developed, and considerably worn, and so are the molars, and, moreover, the little extra molar does not correspond in form and size to the ordinary last molar, that is here represented by the penultimate tooth.

[1] The width of the two foremost incisors together, and in their natural position, varies from nearly 3 lines to nearly 3½ lines, measured at the base, in *H. Graii*; in *H. Gaimardi* they give about 2¼ lines, and in *H. penicillatus* about the same—sometimes 2½ lines; they are much more compressed in the two species last mentioned.

HYPSIPRYMNUS (*Bettongia*) GAIMARDI.

Gaimard's Rat-Kangaroo.

Kangurus Gaimardi.	DESMAREST, Mammalia, Supplement, p. 542, Sp. 842, 1822.
Hypsiprymnus White.	QUOY and GAIMARD, Voyage de l'Uranie, Zool. p. 62, Plate 10, 1824.
Kangurus lepturus.	QUOY and GAIMARD, Bullet. des Sci. Nat. January, 1824, tom. i. p. 271.
Hypsiprymnus Phillippi.	OGILBY, Proceedings Zoological Society for May, 1838, p. 62.
" *formosus.*	OGILBY, *l. c.* p. 62.
" *minor.*	(Potoroo), Cuv. Règ. Animal, p. 185.

Fur long and soft; prevailing hue ashy brown, much suffused with rusty yellow; under parts white, suffused with yellow; ears internally clothed with yellow hairs; feet dirty white, the heel and sides of the hind foot yellowish rust coloured; tail of a brightish rust colour above, paler beneath; the apical third clothed on the upper surface with longish, bushy, brown-black hairs, but at the extreme point with a few white hairs. The fur both on upper and under parts of the body is grey next the skin; the hairs on the back are blackish at the point, and annulated with yellowish white below the point. From specimen in the Paris Museum. [One inch or more of the apical portion of the tail is generally white.]

Inhabits New South Wales and South Australia.

Being the only Kangaroo-Rat known to the French zoologists, and coming from the same part of Australia, it was natural that the present species should have been confounded with the Potoroo of White. This last mentioned animal (which is the *Macropus minor* of Shaw), however, is a distinct species, as is proved by the skull of White's original

specimen still preserved in the College of Surgeons' Museum[1]. The "Potoroo" of the French naturalists was found by M. Gaimard in the neighbourhood of Port Jackson, and formed part of the collection added to the Paris Museum by Freycinet's voyage. It was first described in 1822, by Desmarest, under the name *Kangurus Gaimardi*, and in 1824 received the specific names *Lepturus* and *Whitei* by Messrs. Quoy and Gaimard. The specimen from which these authors drew up their accounts is likewise the original of the above description[2]. Its dimensions are as follows:—

	Lines.	Inches.
Length from nose to root of tail ...	13	6
" " to ear	2	9½
Length of tail	13	0
" of tarsus, to base of claws ...	4	1
" *of fore-arm and hand to base of* claws about	3	2
" of ear	1	0

I feel no doubt that this is the same species as the *Hypsiprymnus Phillippi* of Mr. Ogilby, the original specimens of which are contained in the Museum of the Linnean Society, and are from New South Wales. They present the following characters:—

About the size of a rabbit: the tail is long, and the tarsi long and slender; the ears of moderate size, and rounded form. Fur long, and moderately soft; general tint grey-brown, slightly washed with rusty yellow; under parts grey-white, very faintly tinted with yellow; feet very pale brown; ears well clothed with fur, externally of the same colour as

[1] See the account of *Hypsiprymnus minor* vel *murinus*.

[2] On the under side of the stand of this specimen I found written "Potoroo White; Hypsiprymnus White, Quoy and Gaimard; Macropus minor, Shaw; Kangaroo-Rat, Phillip's Voyage; Potoroo Rat, Desmarest; and Kangaroo de Gaimard."

that of the head, and internally, with yellow hairs. Tail furnished above with moderately long, and somewhat adpressed rich brown hairs; beneath, with hairs of a very pale brown colour: a crest of long dark brown hairs runs along the upper surface of the apical portion of the tail, occupying about one-third of its entire length; at the point is a tuft of long white hairs. The fur on the upper parts of the body is deep grey next the skin, and each hair is yellowish white externally, but dusky at the point; the longer interspersed hairs are black at the point, and annulated with whitish below the point. The fur on the belly is of a very pale grey hue next the skin.

	Inches.	Lines.
Length from nose to root of tail ...	16	0
" of tail	13	0
" of tarsus, without the claws ...	4	3
" of ear	1	2

I am indebted to Mr. Owen for the loan of a careful drawing of the skull of *Hypsiprymnus Whitei*, or *Kangurus Gaimardi*, which he had made whilst at Paris. This skull is intermediate in some respects between the skulls of *H. penicillatus* and *H. Grayi;* it differs, however, from both in having the auditory bullæ smaller, and the interorbital space broader. From *H. penicillatus* it may be distinguished by its great breadth, the zygomatic arches being thrown out somewhat more boldly, and the premolar tooth longer from front to back; the palate is likewise rather longer.

A skeleton in the College of Surgeons, bearing the name *Hypsiprymnus Hunteri*, has the skull agreeing so closely with that of the *H. Whitei*, as to leave no doubt on my mind of the specific identity. This skeleton measures from the tip of the skull to the end of the tail 26″-6″; the scapula is 1″-7‴; the humerus 1-5⅓; the ulna 2-1⅔; the radius 1-9½; the hand 1-4½; femur 3-7; tibia 4-7; tarsus 4-9½. The fibula has nearly two-thirds of its length (distal extremity)

anchylosed to the tibia.[1] The vertebræ are—cervical, 7; dorsal, 13; lumbar, 6; sacral, 2; caudal, 24=52.

In Mr. Gould's collection is a skull labelled as belonging to the *Hypsipr. Whitei*, which also agrees in *the smaller size of the auditory bullæ, and the greater width of the inter-orbital space*, (as compared with that of *H. penicillatus*), but which has the nasal bones considerably broader than in the Paris skull above alluded to, or in the *H. Hunteri*. I am still inclined, however, to think the skull in question is correctly labelled, for in the College of Surgeons' Museum is a fourth skull, which presents an intermediate condition of the nasal bones. I subjoin the dimensions of these skulls.

	H. Whitei, Par. Mus.		H. Hunteri Coll. Surg.		H. Whitei, Gould's Collectn.*		Skull of Young Animal in Coll. Surg.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of cranium	2	11	3	0	2	11	2	6
Width	1	8	1	8½	1	8	1	4⅔
Length of nasal bones	1	2½	1	2¼	1	2	1	0
Width of ditto, at the base	0	6¾	0	6⅓	0	7¾	0	6⅓
Ditto near the apex, at the root of the free portion	0	3	0	3⅔	0	3⅔		
Space between orbits	0	9⅓	0	9½	0	9¼	0	8
Length of frontal bones	0	11			1	0⅔		
" of palate, to the posterior emargination	1	3			1	2¼		
" of auditory bullæ ...					0	5¾	0	5½
" of the three incisors on either side of the upper jaw, taken together ...	0	4	0	4	0	4		
Width of the anterior pair of incisors, taken together			0	2¼	0	2¼		

[1] In the *H. murinus*, the tibia and fibula are distinct.

* See Pl. 10, fig. 4.

	H. Whitei, Par. Mus.		H. Hunteri Coll. Surg.		H. Whitei, Gould's Collection.		Skull of Young Animal in Coll. Surg.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Between incisors and canine ...	0	0¾	0	0¼	0	0¾		
" canine and premolar ..	0	3⅘	0	4	0	*3¼		
Length of the premolar	0	3¾	0	3½		† {2½ 3¼		
Space occupied by the premolar and four molar teeth	0	11	0	11	0	‡9¼		
Length from front of anterior incisor, to front of premolar ...	0	9½	0	9¼	0	9½		
Height of lower jaw, measuring from the apex of the coronoid process downwards			0	9	0	9½		

I have to remark, that the dimensions given in the last column are those of the skull of a young animal having but two molar teeth, in addition to the premolar, on each side of either jaw, and of these teeth the hindermost molar only, is a permanent tooth. This is the young animal alluded to in "Marsupialia," p. 183, as presenting the external characters of Mr. Ogilby's *H. formosus*. The original of Mr. Ogilby's description is in the Museum of the Linnean Society, and may be described as of a greyish yellow hue, somewhat suffused with pale rust colour; under parts dirty white; tail brown above, very pale brown beneath; towards the apex, on the upper surface, the hairs are somewhat longer, and assume a deep brown hue; about one inch of the apical portion, how-

* In this case the premolar is a milk tooth.

† The smaller dimension gives the length of the milk tooth, and the larger that of the permanent one.

‡ Three of these molars only are permanent teeth.

ever, is white,—not the "*latter half*" white, as described by Mr. Ogilby. It measures from the tip of the nose to the root of the tail, 11 inches; the tail is 10 inches, and the tarsi, without including the claws, 3″ 11‴.

HYPSIPRYMNUS (*Bettongia*) PENICILLATUS.

Tufted-Tailed Rat-Kangaroo,

(*Plate* 9.)

Bettongia penicillata, GRAY, Mag. Nat. Hist. for November, 1837, vol. i. (New Series,) p. 584. WATERHOUSE, Marsup. p. 183. GOULD, Monogr. of the Macropodidæ, Pt. 1, Pl. 14.

Hypsiprymnus murinus, OGILBY, Proc. Zool. Soc. for May, 1838, Pt. 6, p. 63.

" *setosus*, WATERHOUSE, Catal. of the Mammalia of the Zool. Soc. (1838), p. 65.

" (*Bettongia*) *Ogilbyi*, GOULD'S MSS. WATERHOUSE, Marsupialia, p. 185.

Bettongia Gouldii, GRAY, List of the Mammalia in the British Museum Collection, 1843.

Fur long and moderately soft: general colour ashy brown; sides of head and throat slightly suffused with yellowish; under parts dirty white, very obscurely tinted with yellow; ears clothed with yellow hairs internally: tail brown, somewhat pencilled with pale rust colour: the apical third, clothed above with long, bushy, black hairs; the under surface brown-white, brown towards and at the apex: fore feet brown-white; tarsi pale brownish ash colour.—Skull, Pl. 6, fig. 3.

Inhabits New South Wales.

The following detailed description is drawn up from a specimen in the Museum of the Zoological Society, which is the original both of Mr. Gray's diagnosis of *Bettongia peni-*

cillata, and of that of Mr. Ogilby of his *Hypsiprymnus murinus*. The name *setosus* was attached to the specimen in question, by mistake; an error which also appeared in the Catalogue of the Zoological Society's Collection; the *H. setosus* of Mr. Ogilby being in fact specifically identical with the Potoroo of White—*H minor*, or *H. murinus* of authors.

The *H. penicillatus* is about equal in size to the common Rabbit; its fur is tolerably long, and moderate as to texture: general colour, ashy brown, but freely pencilled with white, and on the back pencilled likewise with brownish black; the under parts of the body dirty white, and indistinctly suffused with yellow: a faint yellowish tint is observed on the cheeks and throat. The ears are clothed internally with yellow hairs; externally, the hairs are chiefly brownish white, but at the margin they are brown-yellow. The top of the muzzle is brown near the apex; the naked part, or muffle, terminates in a line with the posterior angle of the nostril opening. The tail is brown, pencilled with rusty white; the apical third, clothed with long, bushy, black hairs; these become gradually longer to the tip, where they are about three-quarters of an inch in length: the under parts of the tail are clothed with stiff adpressed hairs of a very pale brownish colour; a trifle darker towards the end of the tail. The tarsi are of a pale brown tint, and the fore feet are brown-white. The fur on the back is grey next the skin; each hair is brown-white towards the point, and brownish black at the point. On the abdomen and chest, the hairs are of a pale grey hue next the skin.

	Inches.	Lines.
Length from tip of nose to root of tail ...	13	6
" of tail	11	3
" of tarsus and claws	4	4
" from nose to ear	2	10
" of ear, about	0	10
" of fore-arm and hand, about ...	2	11

Hypsiprymnus (*Bettongia*) *Ogilbyi*.

Mr. Gould distinguishes, under the name *B. Ogilbyi*, a species of Hypsiprymnus, which is found in the Swan River district, and also in South Australia. This I cannot think is sufficiently established as a species, distinct from the *Hypsiprymnus penicillatus*. The first two or three specimens of *B. Ogilbyi* which came under my notice, having the feet of a deepish brown colour, the tail of a rusty brown hue, and the apical third black, below as well as above, I imagined they might, perhaps, prove distinct from the *H. penicillatus*; but recently I have examined many specimens, both from West and South Australia, and others from New South Wales, and found them to vary somewhat in each of those localities, as to their colouring. All that can be said is, that the specimens of the Tufted-tailed Hypsiprymni from the western and southern districts are generally somewhat darker in the colouring of the feet and tail than those from New South Wales; but it is certainly, in some cases, difficult to distinguish these, which I can but regard as local varieties, by this difference of the colouring.

Amongst a series of skulls, a great portion of which were lent me by Mr. Gould, and some of which are contained in the British Museum Collection, in the museum of the Zoological Society, and that of the Royal College of Surgeons, I could discover no points of distinction between those which were from specimens of *B. penicillata* and those named by Mr. Gould *B. Ogilbyi*. Of the skulls of *B. penicillata*, from New South Wales, but few specimens have come under my notice; but of *B. Ogilbyi*, I have examined many specimens of both sexes, and of young and adult individuals: the size and proportions of some of these skulls are expressed in the following table of measurements:—

	B. Ogilbyi. Female, Adult. Mr. Gould's Collection.		*B. Ogilbyi.* Female, Adult. Mr. Gould's Collection.		*B. Ogilbyi.* Male, Adult. Mr. Gould's Collection.		*B. Ogilbyi.* Male, Adult. College of Surgeons. From Mr. Gould's Collection.		*Bettongia penicillata?* Male. Mus. Zoolog. Society.		Skull from New South Wales. Coll. Surg. From Mr. Gould's Collection.		*Bettongia penicillata.* Specimen *b*, Brit. Mus. Catalogue. From Liverpool Plains.	
	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.
Total length of skull	3	0	3	1	2	10	2	$10\frac{2}{3}$	3	0	2	11	3	0
Width from the outer side of zygomatic arches	1	$7\frac{1}{3}$	1	$7\frac{1}{3}$	1	7	1	$6\frac{1}{2}$	1	$7\frac{3}{4}$	1	$6\frac{3}{4}$	1	$7\frac{1}{2}$
Length of the nasal bones	1	2	1	2	1	1	1	1	1	$2\frac{1}{2}$	1	$1\frac{1}{2}$	1	$2\frac{2}{3}$
Width of ditto at the base	0	$5\frac{3}{4}$	0	6	0	6	0	$5\frac{1}{3}$	0	$6\frac{1}{4}$	0	$6\frac{1}{4}$	0	6
" " near the apex	0	$3\frac{1}{4}$	0	3	0	$3\frac{1}{3}$	0	3	0	$3\frac{1}{3}$	0	$3\frac{1}{2}$	0	$3\frac{2}{3}$
" of interorbital space	0	8	0	$8\frac{1}{4}$	0	$7\frac{3}{4}$	0	$8\frac{1}{4}$	0	$8\frac{2}{3}$	0	8	0	$8\frac{1}{4}$
Length of three incisors on one side of the upper jaw, taken together	0	$3\frac{2}{3}$	0	$3\frac{2}{3}$	0	4	0	$3\frac{2}{3}$	0	$3\frac{3}{4}$	0	$3\frac{10}{12}$	0	$3\frac{10}{12}$
Distance between incisors and canine	0	$1\frac{1}{6}$	0	1	0	1	0	$0\frac{3}{4}$			0	$0\frac{3}{4}$	0	$0\frac{1}{4}$
" between canine and premolar tooth ...	0	$4\frac{2}{3}$	0	5	0	$4\frac{1}{2}$	0	$4\frac{1}{2}$			0	$3\frac{1}{4}$	0	$4\frac{3}{4}$
Length of premolar	0	$3\frac{1}{6}$	0	$3\frac{1}{6}$	0	$3\frac{1}{3}$	0	$3\frac{1}{6}$	0	$3\frac{1}{2}$	0	$3\frac{2}{3}$	0	$3\frac{1}{4}$
" of molar teeth and premolar together ...	0	$9\frac{1}{2}$	0	$9\frac{1}{2}$			0	$9\frac{1}{2}$	0	10	0	$10\frac{1}{2}$	0	9
" of palate, *to the foremost edge of posterior opening*	1	2									1	$1\frac{1}{2}$	1	$1\frac{1}{2}$
Height of lower jaw, measured in a vertical line dropped from the apex of coronoid process	0	$10\frac{3}{4}$	0	10	0	$10\frac{1}{3}$			0	10	0	$9\frac{1}{2}$	0	$9\frac{3}{4}$
Distance between back part of condyle of lower jaw and fore part of coronoid process, *measured in a horizontal* line	0	$6\frac{3}{4}$	0	7	0	$6\frac{3}{4}$					0	7	0	7

These dimensions show the extreme of variation which I have observed in the skulls of numerous specimens of the Rat-Kangaroo under consideration: they also teach us that, unlike the true Kangaroos, there is not any marked difference in the size of the cranium of the two sexes. As regards the fifth and sixth columns, it will be perceived that the two skulls, the dimensions of which are there given, have the nasal bones rather broader behind than the other skulls, and the premolar tooth is a trifle longer from front to back. The animal from which the skull of the sixth column is taken was not sent home; that belonging to the skull of the fifth column is in the museum of the Zoological Society, and is the specimen figured in "Marsupialia" (Plate 16). Of this specimen (which is a male), the habitat is unfortunately not known: in its colouring it is, in some respects, intermediate between the *B. penicillata* and *B. Ogilbyi*, having the rich rusty brown tail of the latter, but the tarsi paler, though considerably suffused with rust colour, especially about the heel. Its dimensions are given below, in column A.

The dimensions of a skull given in the seventh column are those of a male specimen of *Hyps. penicillatus* in the British Museum, from Liverpool Plains, New South Wales, (specimen *b* of the Museum Catalogue). This individual agrees closely with the original specimen in the Zoological Society's Museum; but I do not perceive any yellow tint on the under parts of the body, which are here impure white; and on the chest is a patch of white hairs which are uniform throughout, having no grey at the root as usual. Its dimensions are given in column B.

In two specimens of *B. Ogilbyi*, in Mr. Gould's Collection, from the vicinity of York, Western Australia, the general colouring of the fur was brown, but freely pencilled with yellowish white; the cheeks and sides of the body distinctly suffused with yellow; the under parts yellow-white; ears

with yellow hairs internally; externally with hairs of the same colour as those of the head, but brownish at the margin; the tarsi of a rusty brown hue, but with the toes of a deepish brown, especially at the sides; tail rusty brown, with the apical half, which is covered with bushy hairs, brown-black; the under side brown, assuming a deep brown tint at and near the tip. The dimensions are given in columns C and D: those of column C are from a male specimen, and those of column D are from an individual which is apparently a female.

A female specimen in the British Museum Collection (*b* of the Catalogue) differs from the above in having the fur somewhat softer, and the apical third of the tail perfectly black beneath as well as above. For its dimensions, see column E. This is no doubt an immature individual.

The British Museum collection contains likewise individuals from South Australia, which have, as in the one last mentioned, the apical portion of the tail black both above and below, and one in which it is brown beneath. They vary as to the intensity of the colouring of the feet. I may notice also a specimen in the Zoological Society's Museum, in which there is a small tuft of white hairs at the end of the tail. The skull presents all the usual characters of the species.

	A		B		C		D		E	
	In.	Lines.	In.	Lines.	In.	Lines.	In.	Lines.	In.	Lines.
Length from nose to root of tail	15	0	14	6	15	0	16	0	13	0
" of tail ..	12	9	12	0	13	0	12	0	10	6
" of tarsus and claws ...	4	2	4	4	4	4	4	3	4	2
" of ear	1	1½	1	1	1	0	1	0		11

As regards the skull in *H. penicillatus* (pl. 6, fig. 3), I have only to remark, that it is narrower than other species of

the Bettongia section which have come under my observation; the zygomatic arches are less boldly thrown outwards than usual, and have the middle portion of the zygoma nearly straight; the face is somewhat elongated, and acutely pointed; the nasal bones narrow; the auditory bullæ large; the palate deeply emarginated posteriorly; the incisor teeth are much compressed; the canine moderate as to size; the premolar short from front to back, as compared with other species, and deeply sulcated in the vertical direction, both internally and externally; the number of grooves on either side is about seven. The foremost molar of each series is the largest, and the hindermost the smallest, and is about equal in width to two-thirds of that of the foremost molar; the upper outline of the skull, as viewed from the side, presents a gentle and nearly even convex curve, but descends somewhat suddenly towards the occipital crest, and the interorbital space is nearly flat.

Although there are some slight variations in the width of the nasal bones, and even in the antero-posterior extent of the premolar tooth, it does not appear that these are connected with differences in the animals, nor that such differences distinguish the *H. Ogilbyi* from the *H. penicillatus*.

A great portion of the Marsupialia possess a prehensile power in the tail, and in the tree-climbing Opossums and Phalangers this organ is used as a fifth hand, hanging by its means, as they do, from the branches of trees. In the great Kangaroos, the tail, though not prehensile, still assists in locomotion This, however, does not appear to be the case in the Kangaroo-rats. In *Hypsiprymnus minor*, and some nearly allied species, in which the tail resembles that of a rat, being sparingly clothed throughout with short hairs, that organ appears neither to have any prehensile power nor to be used to support part of the weight of the body, as in the Kangaroos; but in the Bettongias.—in which the apical

portion of the tail is furnished above with a brush of long hairs, and clothed beneath with short hairs which are closely applied to the skin, the organ in question possesses the prehensile power—a power of encircling and holding objects; but here the tail is used, as Mr. Gould informs us, for carrying grasses, &c., with which these animals form their nests. The nest, Mr. Gould states, is placed in a hollow in the ground, excavated for its reception, and, its upper surface being on a level with the surrounding herbage, it requires the practised eye of the native to discover it. During the day the nest is generally tenanted by one, and sometimes by a pair, of these small Rat-Kangaroos, and these lie perfectly concealed from view, there being no apparent outlet. It would seem, that after they have crept in, they drag some grass over the entrance. In the evening they sally forth in quest of food, which consists of grasses and roots; the latter being procured by scratching and burrowing, for which the strong claws of their fore feet are well adapted.

Bettongia Gouldii.

The specific name *Gouldii* is applied by Mr. Gray to a very young animal contained in the British Museum Gallery, which it appears to me merely presents the immature condition of the *Hypsiprymnus penicillatus*. This specimen is about the size of a Common Rat (*Mus decumanus,*) being 7½ inches in length from the tip of the nose to the root of the tail. The fur is of a brownish tint, the hairs being pencilled with black and yellowish white: the under parts of the body are white, but in parts suffused with yellow. The tail is nearly 7 inches in length, of a rusty brown colour at the base, and the terminal half is black both above and below. The tarsi are brown, and, as is usual in young animals, are disproportionately large, being 3¼ inches in length, including the nail of the central toe. The animal in question is from

South Australia. From the same quarter the British Museum collection has received the skull and foot of a Rat-Kangaroo, the former of which is represented on Plate 6, *fig. 1*. This skull, as will be seen upon comparing the figure alluded to with the skull, figure 3, on the same plate, greatly resembles that of *H. penicillatus*, but differs in being considerably smaller, and in having the nasal bones shorter: the palate moreover, is rather more deeply emarginated behind, and the hindermost molar of each series is proportionately smaller, being about half a line only in diameter. The foot which was sent with it, as appertaining to the same animal, resembles that of *H. penicillatus*, but is more slender, and the claws, or nails, are narrower. As the permanent premolar and all the true molars are fully developed, the animal must have been adult, and there would seem to be some grounds for the belief that there exists in South Australia a species of Rat Kangaroo, nearly allied to, but distinct from the *H. penicillatus*; the general resemblance which exists, however, between the two skulls, figs. 1 and 3, Plate 6, is such, that I am rather inclined to believe that the smaller one belonged to an individual of *H. penicillatus*, which from some cause was stunted in its growth. Following are the dimensions of the small skull.

	Inches.	Lines.
Total length of skull	**2**	$6\frac{1}{2}$
Width of ditto	**1**	$5\frac{1}{4}$
Length of nasal bones		**11**
Width of ditto at the base		5
" **of ditto near the apex**		$2\frac{2}{3}$
Length of frontal bones	**1**	**0**
Width of interorbital space		$7\frac{1}{2}$
Length of palate		**11**
" **of auditory bullæ**		**6**
" **of three incisors of upper jaw**		$3\frac{7}{10}$
" **between incisors and canine**		$0\frac{1}{2}$
" **between canine and carnassier**		$3\frac{1}{4}$
" **of carnassier**		3
" **of ditto, and four molars, taken together** ...		$8\frac{1}{3}$

HYPSIPRYMNUS (*Bettongia*) CAMPESTRIS.

Plain Rat-Kangaroo.

Bettongia Campestris. Gould, Proceedings of the Zoological Society, for June, 1843, Part 11, p. 81.

Head broad and short; ears short and rounded, well clothed with yellow-white hairs internally; brown externally, excepting at the base behind, where they are white: fur long and soft, prevailing tint very pale ochreous yellow, but pencilled with black; under parts pale buff-yellow; legs and feet yellowish, the former slightly tinted with rust colour, and this hue is observed near the root of the tail; the toes of the fore feet slightly suffused with brownish. Tail rather sparingly clothed with very pale adpressed hairs. Skull, Plate 6, fig. 2.

Inhabits South Australia.

This is a very distinct species, remarkable for its short and broad head, and general pale yellowish colouring. The hairs of the back are grey at the root, yellow in the middle, then blackish, followed by a long yellow-white space, and black tip; on the chest and belly they are pale grey at the base, and yellowish externally, but on the lower part of the abdomen the grey is wanting. The upper lip is white: the muffle is naked and broad; the fore legs small, and the claws of the fore feet are long, and white: the tarsi are very long, and of a rusty white hue. The tail is moderately long and slender, but sparingly clothed with small pale hairs on the upper surface and at the sides, and scales are visible as in the rat's tail; on the under part, the hairs are more dense, harsher, and of a brown-white colour. The sides of the body, and outer surface of the hind legs, are of a more distinct yellowish hue than other parts.

	Inches.	Lines.
Length from nose to root of tail	15	6
" of tail	13	0
" from tip of nose to ear	2	8
" of ear	1	1
" of tarsus and claws	4	10
" of skull	2	8
Width of ditto	1	8
Length of nasal bones	1	4
Width of ditto, at the base		$10\frac{1}{3}$
" of ditto, near the apex		$4\frac{1}{2}$
Length of frontal bones		9
Width of ditto between the orbits		$8\frac{2}{3}$
Length of three incisors of upper jaw, taken together		$3\frac{1}{4}$
Space between incisor and canine		$1\frac{1}{4}$
" between canine and premolar		3
Length of premolar		3
" of series of molars on one side of upper jaw, including the premolar		$10\frac{1}{4}$
" of auditory bullæ		$5\frac{1}{2}$

The skull of *Bettongia campestris* differs considerably from the crania of other species of the genus; it is short, and most remarkable for the great width of the nasal bones; these, and the frontals, present nearly a flat surface, but the latter are slightly concave between the orbits: the auditory bullæ are rather small. The two foremost incisors are broad; the second incisor on either side is unusually small, the third moderate: the canine is a minute tooth, scarcely more than a quarter of a line in width. The premolar is shortish from front to back, and the outer surface is concave in the same direction, and exhibits but a faint indication of three or four vertical grooves; the little lobe on the inner side and back part of this tooth is rather more developed than usual: the molar teeth are rather large in proportion to the skull; the last molar is larger than in either *B. Graii* or *B. penicillata.* The palate is very deeply emarginated behind, and consequently very short, terminating in a line with the hinder part of the premolar tooth. The skull of which the dimen-

sions are given is from an old male, and has the temporal ridges very distinct.

Sub-genus 3, *Potoroüs*.

Potoroüs. DESMAREST, Nouv. Dict. d'Hist. Nat. tom. xxviii. p. 79. 1819.
" " Mammalogie, Part 1, p. 271. 1820.
Hypsiprymnus. ILLIGER, Prod. Syst. Mamm. et Avium, p. 79. 1811.[1]

Head elongated; tarsi short; tail sparingly clothed with short stiff hairs, and exhibiting a scaly skin: muffle naked.

[1] Of the names *Potoroüs* and *Hypsiprymnus*, applied in a generic sense, the former by Desmarest, and the latter by Illiger, to the animal called the Kangaroo-Rat, in White's Journal, that given by Desmarest (which is formed from the native name Potoroo) was undoubtedly the first proposed, since it is quoted by Illiger in his Prodromus, where he first defines the genus *Hypsiprymnus*. I am not aware, however, whether the section was characterised in the first edition of the Nouveau Dictionnaire d'Histoire Naturelle, in which, according to Desmarest, the name Potoroüs first occurs, not having been able to obtain a sight of that edition. In the second edition of this work, where Desmarest points out the peculiarities of his genus, he complains of Illiger's having substituted a new name for the one he had previously proposed. It is clear that the definitions of both authors are founded upon the account in White's Journal, and apply to the animal hereafter described under the name *Hypsiprymnus murinus*, an animal which is apparently distinct from the Kangaroo-Rat of Governor Phillip's work, though regarded by Desmarest, and many other authors, as specifically identical with White's Kangaroo-Rat. Since Illiger's classical name has been very generally adopted for the whole Rat Kangaroo group, and "has well taken root," I have thought it desirable to retain the term *Hypsiprymnus* (it has reference to the animal having the hinder part of the back much raised, when the fore feet are applied to the ground, being compounded of the Greek words, ὕψος and πρυμνα,) in the same sense, that is, for the genus, and to use Desmarest's name *Potoroüs*, for the minor section or sub-genus, of which his *Potoroüs murinus* is the type. We cannot conveniently, it may be observed, use either of the names for the *whole*, and at the same time for *part* of the Rat-Kangaroo section.

The species of the present section have the body more compact, the hinder legs shorter, and the head much more elongated and pointed than the Bettongias; the molar teeth are proportionately smaller, and the anterior pair of incisors of the upper jaw are longer, descending much below the level of the other incisors. To these principal points of distinction between the Bettongias and the Potoroos, we may perhaps hereafter have to add the anchylosed and unanchylosed condition of the tibia and fibula: having seen but the skeleton of one species in each, I am not aware, however, whether such a difference is constant. In a skeleton of Bettongia, which I feel no doubt is referrible to the *B. Gaimardii*, contained in the Museum of the Royal College of Surgeons, the bones in question are anchylosed at their lower extremity, whilst in more than one skeleton of the *H. murinus*, I have found the tibia and fibula distinct throughout.

HYPSIPRYMNUS (*Potoroüs*) MURINUS,

Rat-Tailed Hypsiprymnus, or Rat-Kangaroo.

Poto Roo, or Kangaroo-Rat. WHITE'S Journal of a Voyage to New South Wales, p. 286, and Pl. . 1790.
Macropus minor. SHAW, General Zoology, vol. i. Part 2, p. 513, Pl. 116. 1800.
Hypsiprymnus murinus. ILLIGER, Prod. Syst. Mamm. p. 79. 1811.
Potoroüs murinus. DESM. Nouv. Dict. d'Hist. Nat. tom. xxviii. p. 79—80, Mammalogie, Part 1, p. 271.
Hypsiprymnus setosus. OGILBY, Proceedings of the Zoological Society for November, 1831, Part 1, p. 149.
" *Peron*. QUOY et GAIMARD, Zool. de l'Uranie, p. 64.
" *Bettong* of the natives of New South Wales. Mus. Lin. Soc.
" ? *myosurus*. OGILBY, Proc. Zool. Soc. for May, 1835, Part 6, p. 62.

Fur long, loose, slightly glossy, and rather harsh to the touch: general colour, dusky brown; the upper parts of the body much

pencilled with black, and less so with pale brownish yellow; under parts dirty yellowish white; feet dark brown; tail sparingly clothed with short stiff hairs, which do not hide the scaly skin beneath; the hairs black, excepting at the extreme point, where they are white. Skull, Pl. 8, fig. 3.

Inhabits New South Wales. Specimen in the British Museum.

The *Hypsiprymnus minor*, or *murinus*, is readily distinguished from others of the present group, described in the preceding pages, by its elongated head and short tarsus, to which may be added, its rat-like tail, which being furnished with short stiff hairs, and these not very abundant, the scaly skin beneath is but partially hidden. Its form, moreover, is less slender than usual, and its fur is long, and of a dark hue; on the upper parts of the body it may be described as dusky brown, a general tint produced by the admixture of black and pale brownish yellow, the visible portion of the longer and coarser hairs being black, and that of the shorter fur being chiefly of a pale yellow hue: the under parts of the body are of a dirty yellowish white tint, but the fur covering these parts, as well as that of the back, is of a deepish grey colour next the skin. The ears are short and rounded, clothed internally with dirty white hairs, and on the outer side with hairs of the same colour as those of the head; the feet are brown. The muffle is not only naked in front, but a narrow naked space is continued backwards for about a quarter of an inch on the upper surface of the muzzle.

	From N. S. Wales. FEMALE.	
	Inches.	Lines.
Length from tip of nose to root of tail ...	15	6
" of tail	9	3
" from nose to ear, about	3	7
" of ear	1	1
" of tarsus, including the nail of the middle toe	3	2

The present species was first described by Hunter, under the name Potoroo, or Kangaroo-Rat, in the Appendix to White's Journal, and from the description, and somewhat rude figure there given, it would have been difficult to determine which of the numerous species of Rat-Kangaroos since discovered, the Potoroo of White should be referred to, were it not that the skull of that animal is still preserved in the Museum of the Royal College of Surgeons. By the aid of that skull we are enabled clearly to identify the Potoroo of White's Journal, (upon which Shaw founds his *Macropus minor*,)[1] with the *Hypsiprymnus murinus*, of Pander and D'Alton,[2] and with the *H. Peron* of Quoy and Gaimard, founded upon a skull contained in the Paris Museum, of which Professor Owen has been so kind as to lend me a drawing.

Mr. Ogilby states that the animal to which he has given the name of *H. setosus* is known in the colony of New South Wales by the native name "Bettong;" and this remark no doubt has reference to the Rat-Kangaroo, so labelled in the collection of the Linnean Society, which specimens not only agree with Mr. Ogilby's description, but also with the animal I identify with the *Macropus minor*, of Shaw.

The animal described by Mr. Ogilby under the name *Hypsiprymnus myosurus*, agrees so perfectly with the *H. murinus* in every respect excepting certain differences observable in the skull, that I cannot think those differences are specific. It is supposed to have been brought from

[1] It is evident that Shaw's account of the *Macropus minor* is chiefly taken from Hunter's description of the Potoroo, though he likewise refers to the Kangaroo-Rat of Phillip's Voyage in that account. The specific name *minor* is, now that the animal is placed in the genus *Hypsiprymnus*, particularly inappropriate, there being other *Hypsiprymni* of smaller size, and scarcely any which are of superior bulk to the *H. minor*. It would be well to adopt in its stead the next oldest specific name of *murinus*.

[2] Skelete der Beutelthiere.

New South Wales, and the same animal is certainly common in Van Diemen's Land. To describe its colouring would be to repeat the description already given of *H. murinus*: I will therefore merely add its dimensions, together with those of two similar animals from Van Diemen's Land.

	H. myosurus, Ogilby.		Van Diemen's Land Specimens.			
	Inches.	Lines.	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	15	0	13	6	19	0
" of tail	10	6	9	6	9	10
" from nose to ear, about ...	3	11	3	11	4	2
" of ear	1	2	1	2	1	3
" of tarsus, including the claws	3	4	3	2	3	3

The dimensions contained in the second and third columns are from specimens contained in the British Museum, both of which are males. The original of Mr. Ogilby's description of *H. myosurus* is also a male.

The animal figured by White was a female, and other specimens having the same proportions in the skull, which have come under my notice, have been females, whilst those in which the skull resembled fig. 2 of Plate 8 were males. The dimensions of the skull, fig. 2, (which forms part of the British Museum collection), are contained in the third column of measurements given on the next page. The dimensions in the fourth and fifth columns are from crania in the Royal College of Surgeons: they differ from the skull of Potoroo of White, (Pl. 8, fig. 3,) chiefly in being larger, in having the muzzle proportionately more elongated and narrower, and in the frontal bones being produced on either side into a small post-orbital process. With regard to this last-mentioned character, I must observe, however, that in

the figure of the skull of *H. Peronii*, now before me, a small post-orbital projection is represented; this skull in other respects resembling White's Potoroo.

Following are the dimensions of the skull of the Potoroo of White, that of *H. Peronii*, and of three skulls of the *H. myosurus* of Mr. Ogilby.

	Potoroo of White. Col. Sur.		H. Peron		H. myosurus. Brit. Mus.		H. myosurus. Coll. Surg.			
	Ins.	Lin.	Ins.	Lin.	Ins.	Lin.	Ins.	Lin.	Ins.	Lin.
Total length of skull ..	3	1½	3	2⅓	3	8	3	9	3	9½
Width	1	6⅔	1	6¼	1	9½	1	9⅓	1	8⅓
Length of nasal bones ...	1	4⅔	1	4½	1	6	1	7⅓	1	8¼
Width of ditto at base ...		6		5½		4¼		4		5½
" near the apex		2⅓		2⅔		3		2¾		2½
Interorbital space		7½		7		9½		9		
Length of three incisors taken together, on either side of the upper jaw		3½				4¼		4		
From posterior incisor to canine		1⅓				1½		1⅔		
Between canine and premolar		3¼				3		3		
Length of upper premolar ...		3⅙				3¾		3⅛		
" of premolar, and other molars taken together ...		10½				11¾		10⅔		
From front of foremost incisor to back part of last molar	1	7½			1	10	1	9		
From ditto to front of premolar		9¼				10½		10⅔		

HYPSIPRYMNUS (*Potoroüs*) GILBERTII.

Gilbert's Hypsiprymnus.

Hypsiprymnus Gilbertii. GOULD, Proceedings of the Zoological Society for February, 1841, Part ix. p. 14; Monograph of the Macropodidæ, Part i. Plate 15.

Hypsiprymnus micropus[1] (Gould's MSS.) WATERH. Naturalist's Library, Marsupialia, p. 180.

Fur long, loose, and rather harsh: general colour deep greyish brown; upper parts of body pencilled with black and rusty white, or yellowish white; under parts dirty white; feet brown: skull with the facial portion broad, the outer surface of the superior maxillary bones being very convex.—Skull, Plate 8, fig. 1.

Inhabits King George's Sound.

Skins, or stuffed specimens, of this animal, are difficult to distinguish from the *Hypsiprymnus murinus;* the form of the head, however, must be different in the living animal. The fur is perhaps rather more harsh, and more distinctly pencilled with yellowish or rusty white: on the back the hairs of the fur are of a slate grey colour, and rusty brown externally; the longer and harsher hairs, which are abundant, have the basal half slate grey, and the remaining portion first white, slightly tinted with yellowish rust colour, and then black: some of the interspersed longer hairs have the

[1] Mr. Gould first determined to give the name *micropus* to this species; and when he afterwards applied that of *Gilbertii*, I had no opportunity of altering the former name, which I had adopted in the little volume on Marsupialia, in the Naturalist's Library. There can be no question about the priority, however, since the part of the Proceedings containing Mr. Gould's description was published before the Naturalist's Library volume referred to, which did not appear till August, 1841.

exposed portion entirely black. The fur on the belly is pale grey next the skin, and dirty white externally; the fore and hind feet are brown, but greyish above, excepting on the toes; the ears are densely clothed with brown hairs, excepting at the margin, where they are black, or nearly so.

	Inches.	Lines.	Adult Male. Inches.	Lines.
Length from nose to root of tail ...	15	6	15	0
" of tail, about	7	0	8	6
" from nose to ear ...	3	2		
" of ear	1	1		
" of fore-arm, hand, and nails, about			2	8
" of tarsus	3	7	3	2
" of outer toe and nail ...				8
Outer toe short of central one ...				8
Length of central toe and nail ...			1	3
" of inner toes				6¼
Inner toe short of central one (*i.e.* from tip of nail of central toe to end of nails of the joined inner toes)				9½

The skull of *Hypsiprymnus Gilbertii* closely resembles that of *H. murinus*, as will be seen by comparing figures 1 and 3 of Plate 8; but the former differs in having the muzzle broader, caused by the greater convexity of the facial parts of the superior and intermaxillary bones, and the nasal cavity is therefore more expanded: the molar teeth are also smaller; the premolar in *H. Gilbertii* is but little longer than the foremost true molar, whilst in *H. murinus* it is equal in length to the first true molar tooth, added to that of the second.

	Female. Inches.	Lines.
Total length of skull	3	3
Width	1	6½
Length of nasal bones	1	5¼
Width of ditto at the base		6½
" near the apex		3

	FEMALE. Inches.	Lines.
Width between orbits		8
" of muzzle in a line with the front of the premolar		10¾*
Length from front of foremost incisors to premolar		10¼
" of the five molar teeth, taken together		9½
" (of which, the premolar is a trifle more than		2½)

HYPSIPRYMNUS (*Potorous*) PLATYOPS

Broad-faced Rat-Kangaroo.

Hypsiprymnus platyops. GOULD, Proceedings of the Zoological Society for June, 1844, p. 103.

Head short and broad; muzzle naked at the extremity only; ears small; tarsi short: fur very long, and rather soft; general colour grey brown, with distinct pencillings of white; under parts brownish white; feet brownish white; the tarsi finely pencilled with brownish in front: tail with small hairs applied to the skin, and of a deepish brown colour, almost black on the apical half; beneath, brown-white.

Inhabits Western Australia.

This is a small and very distinct species, readily distinguished from *Hyps. minor* and *H. Gilbertii*, by its having the tip of the muzzle naked in front only; in the two species just named the naked part of the muffle being extended somewhat on the upper surface. The hairs constituting the fur, are, on the back, grey at the root, then yellowish brown, and this is followed by a long space in each hair which is white, and this again is followed by black, that being the colour

* *The same part in a skull of H. murinus, of the same size as the above skull, measures* 8½ lines.

of the tips of the hairs: on the under parts of the body each hair is pale grey at the root, and dusky white externally: the feet are dirty white, indistinctly grizzled with brownish; this latter tint being most distinct on the sides of the toes. The ears are short and rounded; externally clothed with longish hairs, which are partly brown and partly white; the hairs on the inner side of the ears are dirty white. The upper incisors are very small; the posterior two on either side of the jaw project very little from the gum; the foremost two, however, are much longer, descending much below the level of the crowns of the hinder incisors: the canine is small, and situated scarcely one-twelfth of an inch distant from the incisors. The zygomatic arches (so far as one may judge from the skull as enclosed in the skin) must be thrown boldly out from the cranium, and thus give the breadth to the face which suggested the specific name.

	Inches.	Lines.
Length from nose to root of tail	12	0
" of tail (about)	7	6
" of tarsus, including the nails ...	2	8
" of ear		10
" from nose to ear, about	2	7

The specimen from which the above description is taken formerly belonged to Mr. Gould, and is now in the British Museum collection. It is labelled as coming from "Walyema Swamps, about forty miles north-east of Northam, Western Australia." It is the only individual of the species yet transmitted to England. The fur on the upper parts of its body is very distinctly pencilled with white.

As partaking, to a certain extent, of the characters of the Kangaroo group on the one hand, and of the Wombats on the other, I will here notice the extraordinary fossil remains described by Professor Owen under the names of *Diprotodon* and *Nototherium*.

Genus, *Diprotodon*,[1] (fossil.)

Diprotodon. OWEN, in the Appendix to Mitchell's Three Expeditions into the Interior of Australia, 8vo. 1830, vol. ii. p. 362. Report on the Extinct Mammals of Australia, &c. Report of the British Association for 1844, p. 223. Catal. of Fossil Organic Remains of Mammalia and Aves contained in the Museum of the Royal College of Surgeons.

The genus *Diprotodon* contains but one species, the *D. Australis*, an animal which Professor Owen judges must have been of superior bulk to the Rhinoceros. The species was originally founded upon a portion of a tusk, and a fragment of a jaw from Wellington Valley; other specimens have been since transmitted to Professor Owen from the alluvial deposits in the bed of the Condamine River,[2] westward of Moreton Bay, and the district of Melbourne near Port Phillip, has also yielded some interesting fragments of the Diprotodon.[3] Besides portions of the upper and lower jaws, which are clearly referable to the *D. Australis*, the College collection contains some vertebræ, for the most part imperfect,—fragments

[1] This name has reference to the two large tusks with which the fore part of the lower jaw is provided.

[2] The River Condamine is situated in lat. 28° S., long. 130° E.; and Sir Thomas Mitchell (who has presented to the College of Surgeons the specimens above referred to) remarks with regard to this river, that "it is remarkable for forming large basins at some places, and losing its course in swamps at others, and at other parts, again, cutting its course in a deep channel, through deep beds of alluvium, in which these bones are thus brought to light." Catal. of Foss. Mamm. &c. in the College of Surgeons.

[3] These fragments were found by Patrick Mayne, Esq. during the operation of sinking a well, and are now in the museum of the Royal College of Surgeons, having been presented by Dr. Hobson, of Melbourne.

of ribs, of a blade-bone, and of some of the long bones, together with a right heel-bone,—which there are grounds for believing belonged to the same animal.

The various fragments of the lower jaw show that the *Diprotodon possessed one incisor tooth and five molars in* each ramus. The incisor is remarkable for its great size: it is very long, being deeply implanted in the jaw, and its direction approaches the horizontal, but the extremity is slightly curved upwards. A section of this tooth presents a rounded outline, and gives a vertical diameter of one inch and a half, whilst the transverse measurement is nearly an inch. The apices of these incisors were bevelled off as in the incisors of a Rodent, and the resemblance to the cutting teeth of the Rodents is further manifested by the enamel being almost entirely confined to the outer surface of the tooth; the upper and the greater portion of the inner surface being destitute of enamel. The three anterior molar teeth exhibit a marked successive increase in size, whilst the posterior two are nearly equal, and all these teeth are rooted, and with the exception of the first, are longer than broad, and like the molars of the lower jaw of the Tapir, or those of the Kangaroo, the crown presents two elevated transverse ridges, but these ridges are still more elevated than in either of the animals just mentioned: these principal ridges, or cusps, have a slightly elevated ridge running downwards and inwards from their outer angle, which clearly represents the ridge similarly disposed in the Kangaroo's molar tooth, though it is less developed in the Diprotodon, and here there is scarcely a trace of the longitudinal ridge which joins the two principal cusps in the molar tooth of the Kangaroo. Besides the two principal cusps, the band of the tooth is developed into a strong ridge in front, and a still stronger one on the hinder part of the molar; in this respect differing from the molar tooth of the

lower jaw of the Kangaroo, where the band forms a still more prominent ridge on the fore part of the tooth, and is almost always wanting on the hinder part, though it may be seen in some species, as for instance in the fossil species to which Professor Owen has given the name *Macropus atlas*. The length of the fourth molar tooth, in one fragment of a lower jaw is $1\frac{7}{12}$ inch, and its width $1\frac{1}{12}$ inch; the length of the fifth molar is $1\frac{3}{4}$ inch, and its width $1\frac{1}{4}$ inch. The lower jaw is remarkable for the great extent and depth of the symphysial portion, (its vertical diameter, anterior to the molar series, is 4 inches,) a structure which has relation to the great development and deep implantation of the incisors, and which leaves a long toothless interval between these teeth and the molars. The angle of the jaw is distinctly bent inwards, and the lower edge of the ramus at this part presents a broad flattened surface—characters in which we perceive a manifestation of the Marsupial affinities of the animal, and when we find the molar teeth approximating very closely in their structure to those of the Kangaroos, accompanied by dental formula of another herbivorous Marsupial division, the Wombats, where the incisors, as in Diprotodon, are but partially covered by enamel, we have strong grounds for regarding the Diprotodon as a Marsupial animal. But these are not the only grounds adduced by Professor Owen, in proof that the animal under consideration belonged to the Marsupialia; numerous fragments of other parts of the skeleton found together with the parts of the jaws noticed, which at the same time, from their correspondence in mineral condition, and in relative proportions with the jaws, it is highly probable belonged to the same animal, all more or less bear out the conclusion. I shall here only notice two of the most complete bones which were found in the bed of the Condamine River, with the portions of the lower jaw. The first of these is the body of a dorsal

vertebra measuring $2\frac{1}{4}$ inches in antero-posterior diameter, 3 inches in vertical diameter, and $4\frac{3}{4}$ inches in the transverse direction. The most remarkable character presented by this body of a vertebra consists in a deep transversely oblong depression situated in the tract between the neurapophyses, a character very rarely found in mammalian vertebra, but which is found in the dorsal and lumbar vertebræ of the Wombat. The second bone is a right os calcis, or heel bone, which measures 6 inches in length and $5\frac{1}{2}$ in breadth; it presents two large articular surfaces at right angles to each other upon its upper and anterior part, has a short calcaneal process, which is broad, depressed, and bent upwards, and is perforated at the base; there is moreover a thick obtuse process, directed downwards from the internal and under part of the bone. Of this calcaneum, Professor Owen remarks, that it presents some features of that of the *Mylodon* and *Mastodon*, and others which are peculiar to itself, but its essential characters, that of having the articular surfaces two in number, are only found in the Wombat and Koala.

Figures of several of the specimens alluded to in the preceding pages will be found in the Catalogue of Organic Remains, &c. in the Museum of the College of Surgeons.

Genus, *Nototherium*,[1] (fossil.)

Nototherium. OWEN, in the Report of the British Association for 1844, p. 231; and, in Catalogue of the Fossil Organic Remains contained in the Museum of the Royal College of Surgeons, p. 314.

[1] From νότος, the south; and θηρίον, beast.

The genus *Nototherium*, founded upon some portions of lower jaws discovered in the bed of the Condamine River, and presented to the Royal College of Surgeons by Sir Thomas Mitchell, contains two species, both of great size, being it is supposed equal in bulk to the Rhinoceros. The remains in question demonstrate that these Mammals are distinguishable from species of other genera, by the angle of the jaw being curved inwards, and by the absence of lower incisive tusks, combined with a short *symphysis menti*, and, apparently, only four molar teeth, these teeth being rooted, and some of them at least having two transverse elevated cusps.

Nototherium inerme. Owen.

Of this species the College collection contains a right half of a lower jaw, of which the hinder part is imperfect, and a fragment of a second right ramus, added to which is an astragalus, or ankle-bone, which it is probable belonged to the same animal. The dentition in the most perfect portion of a jaw, Professor Owen observes, " consists of molar teeth exclusively, four in number, which increase in size as they approach the posterior part of the series: a small portion of the anterior end of the symphysis is broken away, but there is no trace in that part of the socket of any tooth, and it is too contracted to have supported any tusk or defensive incisor. The length of the jaw is 11 inches: the molar series, which commences one inch in advance of the posterior border of the symphysis, is 6 inches in extent; each tooth is implanted by two strong and long conical fangs, the hindermost being the largest, and both being longitudinally grooved upon the side turned to each other. The first tooth is wanting, and the

crowns of the rest are broken away: the base of the third remains, which gives an indication of a middle transverse valley, which most probably separated two transverse eminences."

The second fragment of a jaw exhibits the concavity along the lower part of the inner surface of the ramus, formed by the bending in of its lower margin continued from the angle of the jaw.

The astragalus alluded to is described as a broad, subdepressed, and subtriangular bone, the angles being rounded off, especially the anterior one; the upper or tibial surface is quadrate, concave from side to side, in a less degree convex from before backwards: a ridge extending in this direction divides the tibial from the fibular surface, which slopes outwards at a very open angle, and maintains a nearly horizontal aspect, presenting an oblong trochlea for the support of the fibula, shallower, and one-third smaller than that of the tibia. The tibial articular surface is not continued on the inner side of the astragalus, but its anterior and internal angle, which becomes convex in every direction, is directly continued into the anterior scaphoidal convexity, which sweeps round a deep and rough depression, dividing the outer and anterior part of the tibial trochlea from the corresponding half of the scaphoidal convexity; this has the greatest vertical extent at its inner part, where it is separated by a narrow rough transverse channel from the part which rested upon the os calcis. The calcaneal surface is single, and covers almost the whole of the under part of the astragalus: the greatest proportion of it is flat and reniform; an angular tuberosity or process being continued from the concave margin, where the pelvis of the kidney, to pursue the comparison, would be situated. On the inner margin of this calcaneal surface, opposite the tuberosity, a small triangular flattened surface is continued upwards upon

the inner and posterior side of the astragalus, and nearly touches the inner and posterior angle of the tibial trochlea. The length of this astragalus is 4 inches 8 lines; its breadth is 3 inches 5 lines; its depth (at the base of the scaphoidal convexity) is $2\frac{1}{2}$ inches.[1]

This great fossil astragalus from Australia, Professor Owen remarks, offers great and remarkable peculiarities, and these are exclusively, but most closely, repeated in certain Australian genera of *Marsupialia*, and especially in the bulkiest of the existing vegetable feeders (the Wombats) which are not saltatorial. "The inference can hardly be resisted, that the rest of the essential peculiarities of the Marsupial organization were likewise present in that still more bulky quadruped, of which the fossil under consideration once formed part.[2]

Nototherium Mitchellii. Owen.

With the molar teeth (at least the penultimate and last), of equal, or very nearly equal size, with those in the jaw of *Nototherium inerme*, the present species has a depth of jaw below the middle of the penultimate molar of $3\frac{1}{4}$ inches, whilst the more perfect portion of the jaw of *N. inerme*, measured at the same part, only gives a dimension of $2\frac{3}{4}$ inches. The thickest part of the jaw of *N. Mitchellii*, beneath the same molar, is $2\frac{1}{4}$ inches, but in that of *N. inerme* it is only 1 inch and 11 lines. A marked distinctive character of the *N. Mitchellii*, as compared with the *N. inerme*, consists in the

[1] Owen, Catal. of the Organic Remains, &c. p. 319-20.

[2] Of this singular astragalus, as well as of the half jaw of *Nototherium inerme*, a beautiful figure will be found in the part of the College Catalogue already referred to.

position of the last molar tooth, which is in advance of the origin or base of the coronoid process, instead of being internal to, and hidden by that part when the jaw is viewed from the outer side. These and some other differences observable in an imperfect posterior half of the left ramus of a lower jaw, found in the bed of the Condamine River, Professor Owen regards as indicating a second species of *Nototherium*, which the Professor has named in honour of Sir Thomas Mitchell, who has exerted himself so much in procuring materials for the elucidation of the organic remains of that interesting continent, Australia.

PHASCOLOMYIDÆ; or Wombat Family.

Phascolomina. Gray, Annals of Philosophy, xxvi. 1825.
Phascolomyidæ. Owen, Classification of the Marsupialia. Proceedings of the Zoological Society for January, 1839, Part 7, p. 19.

Marsupial Mammals with incisor teeth $\frac{2}{2}$; premolars $\frac{1-1}{1-1}$; true molars $\frac{4-4}{4-4}$ = 24; all the teeth rootless.

It is in accordance with the views of Professor Owen that the author separates the Wombats from the other Marsupialia as a distinct family, but it may be questioned whether these animals should not be regarded as forming, as I have before stated, an aberrant section of the *Phalangistidæ*, to which they appear to bear the same kind of relationship as that which exists between the Voles (*Arvicolæ*) and the true Rats, among Rodents, the Wombats differing *chiefly* from the Phalangers in having rootless teeth; but also they differ in the reduced number of incisors of the upper jaw. The habits of the Wombats, as compared with those of the Phalangers, likewise involve other differential characters; such as those observable in the structure of the toes of the fore feet, with their short, broad, and solid nails fitted for burrowing, and the small development of the thumb of the inner toe of the hind foot, this organ not being required for prehension in an animal

living upon the ground like the Wombat. The section *Phascolomyidæ* contains but two recent species; they form the

Genus, *Phascolomys*.[1]

Phascolomys. GEOFFROY, Notice sur une Nouvelle Espèce des Mammifères, &c. Annales du Mus. d'Hist. Nat. ii. p. 364. 1803.
Vombatus. GEOFFROY, Bulletin des Sciences par la Soc. Philom. iii. p. 185. 1803.
Phascolomys. ILLIGER, Prod. Syst. Mamm. p. 77. 1811.
Amblotis. ILLIGER, loc. cit. p. 78.

Body stout; head large and having the upper surface flattened; muzzle obtuse, the muffle naked, the naked part terminating behind in an angle; nostrils very widely separated behind, but converging in front; upper lip cleft; eyes small; ears small and pointed; limbs equal, short and stout; feet naked beneath; the fore feet with five short and stout toes, each furnished with a broad, solid, and but little curved nail; hind feet provided with five toes, of which the first, or innermost, is very small, nailless, and placed nearly at right angles with the foot; the second, third, and fourth toes joined, and having (as well as the fifth toe) long and curved nails, which are concave beneath: tail rudimentary.
Stomach simple; provided with a special gland situated to the left of the cardiac orifice.
Cæcum very short, wide, and with a vermiform appendage.

Till very recently, the genus *Phascolomys* contained but one known species, the Wombat; and this animal was originally described and figured in Collins' Account of the English Colony of New South Wales:[2] and it is upon this description that Geoffroy founded the genus *Vombatus* in 1803. The account of the dentition of the Wombat given in Collins'

[1] From φάσκωλος and μῦς, pouched rat.
[2] 4to. London, 1802. See pages 153 to 158.

work, is, however, very obscure and erroneous:[1] hence when Geoffroy subsequently had an opportunity of examining the animal in question, specimens having been brought alive to Europe by Capt. Baudin, not finding it agree with his published description, he regarded it as constituting the type of a new genus, which he characterised under the name *Phascolomys*. Some years afterwards, Illiger, not aware of the errors in the definition of the genus *Vombatus*, adopted that genus as well as Geoffroy's genus *Phascolomys*, but he proposed the new name of *Amblotis* in lieu of that of *Wombatus*. The dentition of the Wombat is remarkable for its general resemblance to that of the Rodents, which animals it also resembles in its gnawing propensities. The incisor teeth, as in the Rodents, are two in number, in each jaw, and widely separated from the other teeth; they are rootless and very long, curved, and approach to a cylindrical form, but are somewhat compressed (see Pl. 3, fig. 1 *i*.) The molar teeth are also long, curved, and rootless; those of the upper jaw have the convex side of the curve on the inner side, whilst the molars of the lower jaw are reversed in this respect. The true molars are divided into two nearly equal parts by a fold of the enamel entering deeply into the body of the tooth on one side, and a slight indentation on the opposite side; in the molars of the upper jaw the deep indentation is on the inner side, but it is on the outer side of those of the lower jaw. The foremost

[1] The error in the number of the teeth in Collins' work arose probably from a misprint. I may here mention that a specimen, alluded to in the work just mentioned, and which was procured on Preservation Island, was sent by Governor Hunter to Newcastle-upon-Tyne, accompanied by a drawing and description, which latter having been transmitted to Bewick, were published by him in the sixth edition of his History of Quadrupeds. At the British Association Meeting, held at Newcastle, Mr. Gray called attention to the specimen in question, which still exists in the museum of the Natural History Society of that town, and pointed out the identity of the so-called genera *Amblotis* and *Phascolomys*.

molar of each series, which is a premolar, as is often the case with the premolar teeth, represents one half of a true molar; in the lower jaw it is nearly cylindrical, and in the upper jaw it differs in having a small anterior lobe. The two rows of molar teeth of either jaw converge in front, so that they are there separated but by a narrow space, especially those of the upper jaw. A more perfect idea of the structure of the teeth of the Wombat will be obtained upon referring to

PLATE 3.

i. i. FIGS. 1. Are the incisor teeth.
p—m. The premolars.
FIG. 1 *b.* Is the masticating surface of a true molar.
FIG. 1 *c.* Represents the same tooth, viewed from the inner side, and
FIG. 1 *d.* Is the same, viewed from behind.

Fossil remains of a Wombat have been found in the caves of Wellington Valley, approaching very near to the recent species; but after a minute comparison of a considerable portion of a cranium and lower jaw, procured by Sir Thomas Mitchell in the caves mentioned, with the corresponding parts of the recent Wombat, Professor Owen found some differences in the proportions of the teeth which induced him to regard the fossil species as distinct, and in Sir Thomas Mitchell's work,[1] the Professor proposes for it the name,

Phascolomys Mitchellii, (fossil.)

" In this species," Professor Owen observes, " the molar teeth have the antero-posterior diameter greater in proportion to the transverse; as compared with the molars of *Ph. Wombat;*

[1] Three Expeditions into the Interior of Australia, &c. p. 368, Pl. 48.

the first grinder is also relatively larger, and of a more prismatic form; the upper incisors are less compressed and more prismatic; this difference is so well marked, that once appreciated, any one might recognise the fossil by an incisor alone. There is a similar difference in the shape of the lower incisor. The fossil is also a little larger than the largest Wombat cranium in the Hunterian collection."

Length about 3 feet: fur coarse, and moderately long; its general tint grey-brown; on the under parts of the body paler than the upper: ears well clothed with whitish hairs internally, and externally with hairs of the same colour as those of the head, excepting at the tip, where they are blackish: feet black: tail a mere tubercle, of about half an inch in length.

The Wombat is found in New South Wales, South Australia, and Van Diemen's Land, as well as some of the Islands of Bass' Straits. It is a burrowing animal, and remains concealed in its underground retreat during the day, quitting its hole in the night to feed: its food consists chiefly of roots and grass. The flesh is said to resemble pork in its fatness and flavour, but not in colour or texture, being red and coarse. According to Mr. Bass' account, in Col. Collins' work already quoted, the Wombat is by no means active, and has a hobbling or shuffling gait somewhat like that of a bear. When at Cape Barren Island, situated in the straits named after him, Mr. Bass chased one of these animals, and having overtaken it, "by placing his hands under its belly, he suddenly lifted it from the ground and laid it upon its back upon his arm as a child would be. It made no noise," the account proceeds, "nor any effort to escape, not even a struggle. The countenance was placid and undisturbed, and it seemed as contented as if it had been nursed by Mr. Bass from its infancy. He carried the beast upwards of a mile, and often shifted him from arm to arm, sometimes laying him upon his shoulder, all of which he took in good part; until being obliged to secure his legs while he went into the bush to cut a specimen of a new wood, the creature's anger arose with the pinching of the twine; he whizzed with all his might, kicked and scratched most furiously, and snapped off a piece from the elbow of Mr. Bass' jacket with his grass-cutting teeth. Their friendship was here at an end, and the

creature remained implacable all the way to the boat, ceasing to kick only when he was exhausted."

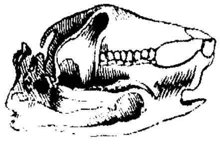
Specimens of the Wombat which have been brought to England have generally evinced a gentle disposition. The specimen dissected by Sir Everard Home, and which was brought from one of the islands in Bass' Straits, by Mr. Brown, the eminent botanist attached to Flinders' Voyage, lived as a domestic pet in the house of Mr. Clift for two years. This animal was a male, measured 2 feet 2 inches in length, and weighed about 20 lbs. The observations made by Sir Everard Home on the habits of this animal whilst in confinement, correspond pretty closely with those already given. "It burrowed in the ground," that author observes, "whenever it had an opportunity, and covered itself in the earth with surprising quickness; it was very quiet during the day, but constantly in motion in the night: was very sensible to cold; ate all kinds of vegetables, but was particularly fond of new hay, which it ate stalk by stalk, taking it into its mouth like a beaver, by small bits at a time. It was not wanting in intelligence, and appeared attached to those to whom it was accustomed, and who were kind to it. When it saw them, it would put up its fore paws on their knees, and when taken up would sleep in the lap. It allowed children to pull and carry it about, and when it bit them, it did not appear to do it in anger, or with violence."[1]

A female Wombat which lived in the Zoological Society upwards of five years, and an account of the anatomy of which is published by Professor Owen,[2] weighed 59½lbs. The fur of the Wombat is tolerably long and very coarse; its general hue is grey-brown: next the skin the hairs on the upper parts of the body are of a dusky brown colour; and each

[1] Philosophical Transactions for 1808, p. 304.

[2] Proceedings of the Zoological Society for May, 1836, Part 4, p. 49.

hair of the ordinary fur has the exposed portion chiefly of a dirty white colour; but the longer and coarser hairs are black at the point: on the under parts of the body the hairs are for the most part of a dirty white colour, but dusky at the root. The general tint of these parts is paler than that of the back. The naked muffle is black; the ears small, pointed, and well clothed with hairs. The legs are short and strong, and the feet broad, naked beneath, and covered with minute, round, fleshy tubercles; the claws are large; those of the fore-feet solid, (that is, not concave beneath), but slightly curved, and depressed; those of the hind feet are curved, slightly compressed, and concave beneath. The hairs of the moustaches are numerous, strong, and of a black colour, as are also some long bristly hairs which spring from the cheeks. The tail is a mere tubercle, and consequently hidden by the fur. The skeleton of the Wombat presents certain peculiarities which are well worthy of attention; for instance, the number of its ribs (and consequently of the dorsal vertebræ) is unusally large, being fifteen, whilst twelve or thirteen are usually found in the Marsupialia. The body of the atlas vertebra remains permanently cartilaginous[1]; the humerus, besides having the inner condyle perforated, has an opening between the condyles; the patella, or knee-bone, is wanting.



Side view of the Skull of the Wombat.

[1] This character, however, is not peculiar, since, according to Prof. Owen, the atlas vertebra of the Koala also retains the cartilaginous condition, and the Professor also calls attention to the general imperfect condition of the part in

In the general form of the skull, the Wombat approaches the Phalangista group more nearly than any other section of *Marsupiata*. The cranium is remarkable, not only for its large size, as compared with the bulk of the animal, (being larger than in the largest Kangaroos), but for its strength: the bones are thick and dense, and the large size of the temporal fossæ, deep and strong zygomatic arch, combined with the great development of hinder parts of the lower jaw, all indicate great power in the masticatory muscles. The general figure of the skull, as viewed from above, approaches to an oval; it is, however, broadest at the posterior root of the zygomatic arch, and thence becomes gradually contracted to the fore part of the zygoma, in front of which it is suddenly contracted; the muzzle, however, is broad, though very short. The upper surface of the skull is very nearly flat above—on the hind part it is quite flat, and the fore part is slightly convex. The nasal bones are nearly flat, short, broad, and much expanded posteriorly. The temporal ridges are strongly marked, though not much elevated; they converge, but do not meet posteriorly in the skull of an aged animal: the occipital crest is considerably produced. The zygomatic arch is stout, deep, and compressed, excepting beneath the eye, where it forms a large horizontal platform: the glenoid cavity or articular surface for the condyle of the lower jaw is of great extent, and forms a concave curve in the transverse direction, but in the longitudinal direction it is narrow and convex; it presents no anterior or posterior process to enclose the condyle of the lower jaw, which, therefore, can move backwards, forwards, and laterally. The palate is narrow, and much contracted between the anterior molars; the

question in Marsupial animals. In most of the species the neurapophyses of the atlas vertebra either remain permanently separated from the body, or are only anchylosed when the animal is aged.

incisive openings are narrow and rather small (half an inch in length); the posterior palatal openings are also small—half an inch long, and a quarter of an inch in width at the widest part, which is behind. The cavity corresponding to the sphenoidal *bulla ossea* in other Marsupials, is here (as pointed out by Prof. Owen) excavated in the lower part of the squamous element of the temporal bone. The condyle of the lower jaw is of great width, but narrow, and convex in the antero-posterior direction: the inflected angular portion is of great size, its width being very nearly equal to the width of the interspace between the two rami behind: the symphysis menti is of great extent: the coronoid process is large, and much elevated. The proportions will be illustrated by the following dimensions, which are taken from a cranium in the British Museum, which evidently belonged to an aged individual. Scarcely any of the sutures are obliterated in this skull—even the sutures indicating the boundaries of the elements of the occipital and temporal bones are distinct; the frontal sutures, and the suture between the nasal bones, are partially obliterated.

	Inches.	Lines.
Total length of skull	8	0
Width	5	11
" between orbits	2	6
Length of nasal bones	2	10½
Width of ditto in front		9⅔
" behind	2	2⅜
Greatest depth of zygomatic arch, behind ..		11½
Length of palate	4	7½
Width of ditto between the posterior molars ...	1	0½
" between the anterior molars ...		5
Longitudinal extent of the five molars of the upper jaw, on either side	2	2
Length of lower jaw	5	11
Height in a vertical line dropped from the coronoid process	3	0
Longitudinal extent of symphysis menti	3	2

	Inches.	Lines.
Width of condyle	1	7
Antero-posterior diameter of ditto		3
Distance between the outer edges of the two rami, behind	5	10
Width from the inner edge of the inflected angular portion to the outer edge of the ramus	2	2

The specimen of the Wombat already alluded to, as having lived in the Menagerie of the Zoological Society, was of a grey colour, and measured 3 feet in length: the following dimensions are from a male specimen, preserved in brine, in the British Museum Collection.

	Inches.	Lines.
Length from tip of nose to root of tail ...	28	0
" of ear	2	0
" from nose to ear	6	0
" of fore foot and nails	3	2
Width of ditto	1	11
Length of hind foot and nails	3	5
Width of ditto	1	6

The feet of this animal are figured in Plate 12.

FIG. 7. Represents the under side of the fore foot, half the natural size.
" 7 *a*. The hind foot, half the natural size.

PHASCOLOMYS LATIFRONS.

Broad-fronted Wombat.

Phascolomys latifrons. OWEN, Proceedings of the Zoological Society for 1845.

Frontal bones broad, and presenting a well-marked supra-orbital ridge, and post-orbital process; width of these bones in proportion to the length of the skull, as 33 to 75: width of skull in proportion to length, as 4 to 5: incisor teeth broadest in front, the upper pair distinctly broader than the lower.

Of the Broad-fronted Wombat, all that is known is a skull sent from South Australia to Professor Owen. This skull presents so many marked differences when compared with that of the *Phasc. Wombat*, that no doubt can be entertained of the existence of two distinct species of Wombats. I have sought in vain, however, amongst the specimens of Wombats contained in our museums, for an animal which might be identified with Professor Owen's new species. In none have I found the incisor teeth presenting the broadest surface in front, a peculiarity in which the *P. latifrons* differs from *P. Wombat*, where the broadest part of the incisor is at the side. The new species differs moreover in having the upper incisors distinctly broader than the lower, whilst in the Common Wombat the upper and lower incisors are very nearly equal in width when viewed in front. The following points of distinction presented by the skull of the *P. latifrons*, when compared with that of the *P. Wombat*, are for the most part pointed out in some notes from the pen of Professor Owen, who has kindly placed them at my disposal.

The skull of *Phasc. latifrons* is rather smaller and broader in proportion to its length; the upper incisors have a semi-oval transverse section; the convex enamelled surface directed more forward, and longitudinally substriated. The lower incisors narrower, trihedral, with the enamelled outer surface flat. The first lower molar tooth relatively larger; the last relatively smaller. The lower jaw is shorter, more suddenly curved behind, and has the symphysis deeper; the intermaxillary part of the skull is higher in proportion to the width, and less convex externally; the palate is less contracted between the foremost molars, and the palatine portion of the intermaxillaries is wider and very concave. The nasal bones are broader, forming the whole upper surface of the anterior third of the skull. The interorbital part of the cranium is much broader, and presents a well-marked supra-orbital ridge

and post-orbital process, both of which are almost obsolete in *Phasc. Wombat.* The temporal fossæ are not bounded, as in the last mentioned animal, by two nearly parallel ridges, but are continued by a convex tract to the upper surface of the cranium: the supra-tympanic depression is much larger.

The subjoined dimensions of the skulls of the two animals under consideration will assist in conveying a more accurate idea of the differences of proportion they exhibit.

	P. latifrons.		*P. Wombat.*	
	Inches.	Lines.	Inches.	Lines.
Total length of cranium	6	3	8	1
Greatest width, (which is at the posterior part of the zygomatic arch)...	5	0	5	9
Length of nasal bones	2	0	2	11
Width of ditto behind	2	5	2	2
" " near the apex ...	1	2		10
Length of frontal bones	2	5	?	
Width of ditto between orbits ...	2	9	2	6
" of skull behind orbits, (where contracted by the temporal fossæ)	1	3	1	11
Length of palate	3	7	4	7
Width between the anterior molars ...		5½		3¾
" " posterior ditto ...		10½	1	0½
" of superior incisor teeth ...		9		9
Depth of ditto		3		5
Distance between incisor teeth (upper jaw) and molars	1	6½	1	11
Total extent of row of molar teeth ...	1	9	2	1½
Length of lower jaw	4	4	5	11
Height in a vertical line dropped from coronoid process	2	9	2	11
Width of lower incisors		6		8
Depth of ditto		3		3¾

PHALANGISTIDÆ; or, PHALANGER FAMILY.

Dentition.—Incisors, $\frac{6}{2}$; canines, $\frac{1-1}{1-1}$, or $\frac{1-1}{0-0}$; constant premolars, $\frac{1-1}{1-1}$; true molars, $\frac{4-4}{4-4}$, or $\frac{3-3}{3-3}$

Head moderate; the facial portion rather short; upper lip cleft; muffle naked.

Limbs equal; fore feet with five well-developed toes, having compressed and curved claws; hind feet with five toes, of which the first, or innermost one, is large, nailless, placed at right angles with the rest, and opposeable to them; the second and third toes more slender and shorter than the others, united in a common integument very nearly to the extremity, and furnished with curved hollow nails; the fourth and fifth toes have curved and compressed claws.

Tail sometimes absent, but almost always long, and more or less prehensile; in some species wanting the prehensile power.

Pouch well developed.

Mammæ two or four.

Stomach usually simple, sometimes provided with a cardiac gland; cæcum present, and, in most species, very much developed.

The Phalangers, so called from their having the second and third toes of the hinder foot united in a common integument, form the fourth family of Vegetable-feeding Marsupial Mammals—that is, taking the groups in the ascending order, and viewing the Wombats as forming a family.

Although the diet of the species of different groups already described, no doubt varies to a certain extent, yet, on the whole, we might say the Kangaroos are more especially grass- and herb-feeders; the burrowing Wombats, root-feeders: the gigantic extinct Diprotodons and Nototheriums probably derived their sustenance from the twigs and leaves

Phalangista, in which the tail is long and prehensile; and, lastly, the genus *Petaurus*, in which the tail does not possess the power of grasping objects. The *Petauri*, moreover, may be recognised by their possessing a loose membrane extended from, and filling up, the space between the fore and hind legs. Other differences observable in the species of these sections are pointed out in their proper places.

PHASCOLARCTUS.

Phascolarctos. De Blainville, Prod. d'une nouv. Distrib. Systèm. du Règne Anim.; Bullet. de la Soc. Philom. de Paris, p. 108. 1816.

Lipurus. Goldfuss, in Isis, p. 271. 1819.

Teeth.—Incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; premolars, $\frac{1-1}{1-1}$; true molars, $\frac{4-4}{4-4} = 30$. Posterior upper incisors and canines small; true molars, each with the crown divided into four pyramidal tubercles.

Body, stout.

Head moderate, the facial portion very short; muffle naked; ears moderate, clothed with long hairs.

Fore feet with two inner toes, which are considerably shorter than the others, slightly opposeable to the remaining three, of which three, the central one is the longest: the nails of all the toes long, curved, very deep, and much compressed.

Hind feet with the first toe, or thumb, very far back, large, very broad, and nailless; the second and third, united toes, con-

molars of the upper jaw, and between the incisors and the corresponding teeth in the lower jaw. These characters, *combined*, I think indicate that I have properly located the Wombat in the tabular view of my arrangement of the Marsupial animals, given in p. 12, in which I have endeavoured so to place the several genera, that those which have the most characters in common, are most nearly approximated.

siderably smaller and shorter than the remaining two, of which the first is the largest.

Tail wanting.

Stomach with a cardiac glandular apparatus: *cæcum* greatly developed[1].

PHASCOLARCTUS CINEREUS.

The Koala.

(*Plate* 9, Fig. 2.)

Lipurus cinereus. GOLDFUSS, in Isis, p. 271. 1819.
Phascolarctos fuscus. DESMAREST, Mammalogie, p. 276. 1820.
" " " Dict. des Sci. Nat. t. xxxix. p. 448. 1826.
" *Flindersii*. LESSON, Manuel de Mammal. p. 221. 1827.
" *fuscus et cinereus*. FISCHER, Synopsis Mammal. p. 285. 1829.
" " " WAGNER, Schreb. Saug. 111-112 Heft, p. 92. 1842.
" *cinereus*. GRAY, List of the Species of Mammalia in the Coll. of the Brit. Mus. p. 87. 1843.
Koala Wombat (Patterson). HOME, in Phil. Trans. p. 304. 1808.
Le Koala ou Colak. DESMAREST, Nouv. Dict. t. xvii. p. 110, Tab. E. 22, fig. 4. 1817.
Wombat of Flinders. KNOX, in Edinburgh New Philos. Journal, p. 111. 1826.
Koala, and Wombat of the natives; Native Bear, and Native Sloth of the colonists.

Length of head and body about two feet: fur dense, woolly, and moderately soft: general colour ashy grey, slightly inclining to brown; hinder part of back dirty yellowish white; under parts dirty white; inner side of hind legs of a brownish

[1] The cœcum in the Koala, the only known species belonging to the present genus, is said to be more than three times the length of the animal. In a young male specimen, dissected by Mr. Martin, the cœcum measured 4 feet 2 inches in length, and was slightly puckered equidistantly, or nearly so, throughout its whole length, into sacculi, by a slight longitudinal (mesenteric) band of muscular fibres. See Proceedings of the Zool. Society for 1836, Part iv. p. 111.

rust colour: ears densely clothed with long hairs; white on the inner side, and greyish on the outer, but blackish on the anterior margin: feet whitish.

Inhabits New South Wales.—Specimen in the British Museum.

An excellent account of the habits of the Koala, or Native Bear, as it is frequently called by the colonists, appeared as early as 1808, in the "Philosophical Transactions[1]," from the pen of Colonel Patterson, formerly Governor of New South Wales.

I am informed by Mr. Gould that the Koala inhabits the range of country extending nearly from Moreton Bay to Port Phillip. It was known to Colonel Patterson as an inhabitant of the forests, about fifty or sixty miles to the south-west of Port Jackson, whence, it is stated, the first specimen was brought to that port[1]. "The New Hollanders," Colonel Patterson observes, "eat the flesh of this animal, and therefore readily join in the pursuit of it: they examine, with wonderful rapidity and minuteness, the branches of the loftiest gum-trees, and, upon discovering a Koala, they climb the tree in which it is seen with as much ease and expedition as an European would mount a tolerably high ladder. Having reached the branches, which are sometimes 40 or 50 feet from the ground, they follow the animal to the extremity of a bough, and either kill it with the tomahawk, or take it alive. The Koala feeds upon the tender shoots of the blue gum-tree, being more particularly fond of this than of any other food: it rests during the day on the tops of these trees,

[1] This account will be found in a memoir communicated by Sir Everard Home to the Royal Society, entitled, "An Account of some Peculiarities of the Anatomical Structure of the Wombat," &c., in which the author, unfortunately, confounds the Koala with the Wombat, being misled by the name "Wombat," which, it appears, is sometimes applied by the natives to the Koala as well as to the Wombat. See Phil. Trans. for 1808, p. 304.

feeding at ease, or sleeping. In the night it descends and prowls about, scratching up the ground in search of some particular roots; it seems to creep rather than walk: when incensed or angry, it utters a long shrill yell, and assumes a fierce and menacing look. They are found in pairs, and the young is carried by the mother on its shoulders. This animal appears soon to form an attachment to the person who feeds it."

I learn from Mr. Gould, that, unlike most quadrupeds, the Koala does not fly upon the approach of man; that it is very tenacious of life, and when even severely wounded it will not quit its hold of the branch upon which it may be at the time. It has been frequently compared to the bear in its movements and mode of climbing; and, indeed, in appearance the animal is not unlike a small bear.

The Koala is usually about two feet in length, and when on all fours stands 10 or 11 inches in height: the girth of the body is about 18 inches. Its limbs are of moderate length, and powerful; the hands and feet large, and admirably adapted by their structure to tree-climbing habits. The toes of the fore feet are so arranged, that the two innermost of the five are opposed to the other three; and all the toes, both of the fore and hind feet (if we except the innermost one of the latter), are provided with large, curved, very deep, and compressed claws. The innermost toe of the hind feet is large, nailless, assumes the form of a thumb, and is used as such, being opposed to the toes in grasping, as is the thumb of the human hand to the fingers. The head is rather large, the muzzle short, and nearly naked both at the sides and on the upper surface, these parts being merely clothed (and rather sparingly so) with small velvet-like hairs: the part thus sparingly clothed is most extended on the upper surface of the muzzle, here reaching back, about one inch and a half,

from the tip of the nose, whilst at the sides only half an inch, or rather more, of the muzzle is destitute of the ordinary fur. The ears are of moderate size, and pointed, and entirely hidden by the very long hairs with which they are clothed, these latter being, for the most part, about two inches in length: on the inner side of the ears the hairs are white, and on the outer side they are of the same grey hue as those of the head, excepting those which spring from the anterior margin of the ear, which are chiefly black. The eye is rather large, and, like other Marsupial animals (with the exception of the Kangaroos), are not protected by eye-lashes; there are, however, a few long bristly hairs springing from immediately above the eye: the hairs of the moustaches are small and scanty. The fur of the animal is tolerably long, dense, of a wool-like quality, and rather soft to the touch; its general hue may be described as ashy grey, somewhat suffused with brown —a tint produced by the hairs being brown below the point, and whitish at the point. The hinder part of the back is of a dirty yellowish-white hue. The under parts of the head and body, as well as the inner side of the fore legs, and the posterior part of the hind legs, are white, but not very pure; the hairs covering the feet have the visible portions whitish, but they are dusky brown at the root, and a slight pencilling of this darker hue is generally observable on the toes. The inner side of the hind legs is a brownish rust colour. The muffle is naked, and, like the naked soles of the feet, appears to have been black in the living animal.

A fine female specimen of the Koala, in the British Museum collection, presents the following dimensions, to which are added (in a second column) some of the principal admeasurements taken from a specimen in the Museum of the Zoological Society:—

	Inches.	Lines.	Inches.	Lines.
Length of head and body, together	29	0	25	0
" from tip of nose to ear ...	5	3	4	6
" of ear, about	2	0	1	9
" fore foot, not including the claws	3	6	3	0
" hind foot, without the claws	3	7	3	1
" thumb of ditto	1	8		

A very young Koala in the Museum of the Zoological Society presents some features worthy of notice. This little animal, which measures about 11 inches in length, instead of having the woolly fur of the adult, is clothed with hairs which are moderately soft, short, and closely applied to the skin: on the mesial side of the back, a little behind the shoulders, the hairs radiate, and running forwards over the neck they meet those of the head having an opposite direction, and form a kind of crest at the line of junction: on the rump there is another of these centres from which the hairs radiate[1]. The ears, which are much pointed, and have the posterior edge emarginated, are clothed with hairs of about a quarter of an inch in length. Its colouring is the same as in the adult.

Skull of the Koala.

The skull of the Koala is remarkable for its oblong quadrate form, the shortness and great width of the nasal bones, which are truncated in front, the parallelism of the zygomatic arches, their great length, and the great protuberances formed by the auditory bullæ; these are nearly spherical, but slightly compressed in the lateral direction, in the young animal, and are much more compressed and considerably elongated in the

[1] I have noticed a similar arrangement of the hairs of the fur in a young Sloth.

vertical direction, in the adult. The pterygoid processes of the occipital bones are much elongated,—10 lines in length in an adult skull. The posterior palatine openings are by no means large, as compared with the Phalangers proper, and are confined to the palatine bones, which assume the form of a vertical plate, of ⅛ of an inch in depth, behind the palatine openings in question.

In the lower jaw, the points most worthy of notice are,—the great depth of the rami, the angle being less twisted inwards than in most other Marsupials—(in this respect resembling the extinct *Diprotodon* and *Nototherium*); the *symphysis menti* being more extended, and the rami more firmly united at this part, than in the typical Phalangers. The four hindermost incisors of the upper jaw and the canines are proportionately smaller than in the animals just mentioned, and the molar teeth are larger, and the four tubercles, which the crowns of the true molars present, are more angular, having each the form of a three-sided pyramid, or nearly so.

The following admeasurements are taken from a skull of an adult Koala, in the Hunterian Museum:—

	Inches.	Lines.
Length of skull	5	0
Width beneath orbits	2	8
Length of nasal bones	1	3¼
Width of ditto behind	1	2
" " at the apex	0	10
Length of zygoma	2	11½
Greatest depth of ditto	0	10
From anterior root of zygoma to apex of inter-maxillaries	1	6
Length of palate, including the palatine bones ...	2	4
Width of ditto between premolars	0	9
Three upper incisor teeth, taken together ...	0	4¾
From posterior incisor to canine	0	2
From canine to premolar	0	4
Length of the five molars, taken together	1	5
Length of lower jaw, measuring to apex of angle	3	10
Height, measuring from apex of coronoid process	2	6

Genus, *Phalangista.*

Phalanger.	STORR, Prodromus Methodi Mammalium, p. 33. 1780.
Phalangista.	CUVIER, Tableau Général des Classes des Animaux, in Leçons d'Anatomie Comparée, tom. i. 1799.
Balantia.	ILLIGER, Prod. Syst. Mamm., &c. p. 77. 1811.

Teeth.—Incisors, $\frac{6}{2}$; canines, $\frac{1-1}{-}$; premolars, $\frac{2-2}{1-1}$; true molars, $\frac{4-4}{4-4}$: —(these teeth are nearly constant).
Tail prehensile.

The number of the teeth in the different species of Phalanger varies, but the differences observable are not important, since they arise from the appearance or non-appearance of certain small teeth, situated between the molars and incisors, which are not always constant even in the same individual Phalanger; one of these teeth will sometimes be found, for instance, on one side of the jaw, and not on the other: all the species, however (with the exception of those belonging to the section *Dromicia*), possess four true molar teeth on each side of each jaw, and each of the series is preceded by a premolar, which is in contact with the true molars: in front of this, and more or less widely separated, is a second premolar in the upper jaw, and which, in most species, is a well-developed tooth, having the elongate conical form of a canine: in front of this, again, is a moderately well-developed canine tooth, which is usually situated more forward, with relation to the intermaxillary suture, than in most other quadrupeds; in most species the tooth is intersected by the line of the suture in question, and sometimes the whole canine is situated in front of the suture—that is to say, the visible portion of the tooth, for I suspect it will always be found to have its root in the superior maxillary bone. Lastly, there are six incisors in the upper jaw. In the lower jaw there are

usually two very small teeth, situated between the two long and nearly horizontal incisors, and the five constant molars.

The upper true molar teeth, in the species we shall first describe, are rather longer than broad, of nearly equal size, if we except the hindermost of each series, which is rather smaller than the others, and have four principal cusps, which are but moderately elevated and angular, and have a tendency to join in pairs, as in the Rat-Kangaroos, by a ridge running in the transverse direction from each of the two outer cusps to the inner tubercle. The hindermost molar of the upper jaw has but three principal tubercles. The principal premolar (or that which joins the true molars) is rather smaller than the true molars, of nearly equal length and breadth, and terminates either in a point, or in a cutting edge of small extent. The true molars of the lower jaw resemble those of the upper, excepting that their transverse diameter is less in proportion to their length.

The nasal portion of the skull is short; the remaining portion of the cranium, as viewed from above, presents a nearly oval outline; the interorbital space is moderately contracted; the zygomatic arches long and deep; the palate presents a large posterior palatine opening. The angular portion of the lower jaw is large, and bent inwards nearly at right angles with the plane of the ascending ramus; the condyle is transverse.

The genus *Phalangista* has been subdivided into four minor sections:—

Section 1. *Cuscus.*

Cuscus. LACÉPÈDE.
Ceonyx. TEMMINCK, Monogr. de Mamm., tom. i. p. 10.

Tail with the basal portion only covered with hair: ears short, almost hidden by the fur of the head; eyes with a vertical or nearly vertical pupil.

The animals belonging to this section are of moderate size (being for the most part about equal to the domestic cat, in this respect), have the fur dense, and of a more or less woolly nature: similar fur covers a portion of the tail, but usually about half the tail is destitute of hair, and presents numerous fleshy tubercles. The species of Cuscus are inhabitants of certain islands in the Indian Archipelago, and, indeed, are confined, so far as we know, to the islands of Celebes, Amboyna, Banda, Waigiou, Timor, New Guinea, and New Ireland.

PHALANGISTA (*Cuscus*) URSINA.

The Ursine Phalanger.

Phalangista ursina. TEMMINCK, Monographies de Mammalogie, t. i. p. 10. Skull of the adult, Pl. 1, figs. 1, 2, and 3; skull of a specimen of intermediate age, Pl. 2, figs. 1 to 5; skeleton, Pl. 4.

" " WAGNER, in Schreb. Saug. 109-110 Heft, p. 69.

Rather larger than the domestic cat: fur of moderate length, dense, and woolly: general colour black, freckled with yellow; head chiefly of the latter colour; under parts of body yellow: ears densely clothed, the hairs yellow, excepting at the base externally, where they are black, and more or less pencilled with yellow.

Messrs. Lesson and Garnot[1] make two minor divisions of the Cuscus group: the first, characterised by the ears being very short, almost hidden by the fur, and well clothed internally, includes the present species, together with the *Cuscus chrysorrhos*, *C. maculatus*, and *C. macrourus*; the second division includes but one species, *C. orientalis*, in which the

[1] See Voyage de la Coquille. Zoologie, p. 154.

ears are somewhat longer, not hidden by the fur, and naked within.

The Ursine Phalanger is readily distinguished from others of its section by its fur being chiefly of a black colour; most of the hairs on the upper parts of the body, however, are usually tipped with yellow, producing a freckled appearance; on the head the yellow colour predominates, and the muzzle, and lower part of the cheeks, scarcely exhibit a trace of the black hue. The under parts of the head and body, as well as the inner side of the limbs at the base, are of a dirty yellow colour; the fur of the abdomen is dark, however, next the skin. The ears are clothed at the base, externally, with black and yellow hairs, like those of the head; on other parts they are densely covered with longish yellow hairs. The naked parts of the feet, tail, and muzzle, appear to have been black, or at least of a dusky hue, in the living animal. Such is the colouring of two specimens in the British Museum collection. A specimen in the Zoological Society's Museum differs in having the general colouring of the fur brownish black, and the parts above described as yellow are of a brownish-white tint: on the upper and fore part of the back the black prevails, and on the hinder half of the back the pale colour is most conspicuous, whilst on the head, tail, and under parts of the body, scarcely any black is perceptible. The basal half of the tail is clothed with fur of the same texture as that of the body; the apical half is destitute of hair, and the naked part is more extended on the under than the upper surface by about two inches: the whole of the naked portion of the tail presents small scattered fleshy tubercles. The toes are but sparingly clothed with hairs; the claws are very large, and of a brownish colour.

Mr. Temminck informs us, that the young of this species differ from the old, in having the fur of a pale colour, and that the old specimens are perfectly black; those of moderate

size brownish black; and those which he supposes to be the young of the year, have the fur of the upper parts of the body of a rusty brown tint; that on the cheeks, the flanks, and the limbs, yellowish brown, and on the under parts yellowish. Adult specimens are said to measure about 22 or 23 inches in length, from the nose to the root of the tail, and to have the tail about 20 or 21 inches in length; whilst the height of the adult animal varies from 10¼ inches to 10¾.

The dimensions of the specimen in the Zoological Society's Museum are as follows:—

	Inches.	Lines.
From tip of nose to root of tail	20	0
Tail	19	0
From nose to ear	3	5
Ear	0	8
Tarsus, without including the nails	3	3

An imperfect skull of *P. ursina*, in the British Museum, closely resembles the cranium figured in M. Temminck's second Plate, and evidently belonged to an animal which was not quite adult. Besides the $\frac{6}{2}$ incisors, and $\frac{5-5}{5-5}$ molars, which are evidently teeth of the permanent series, it has, in the upper jaw, a well-developed canine-like tooth about midway (or rather behind that point) between the incisors and molars, which has a double fang, and between this and the incisors is seen the point of the permanent canine, which is scarcely above the level of the bone: the root of this tooth is situated entirely in the superior maxillary bone, but, when fully developed, it would appear to belong to the intermaxillary teeth, being situated almost entirely in front of the intermaxillary suture. The canine is apparently in the same condition in the skull figured by M. Temminck, and hence this tooth, we may suppose, is the last one to make its appearance in these animals. From the skull of a younger animal,

also in the Museum, I learn that the principal premolar tooth is developed at a relatively earlier period than in the Hypsiprymni, it being more advanced, in the skull in question, than the third true molar. In the Rat-Kangaroos, as I have before noticed, it is the last tooth to make its appearance.

The bones of the skull of *P. ursina* are much thicker and stronger than in the *P. vulpina;* the muzzle is proportionately shorter and broader; the zygomatic arch deeper. The nasal bones are dilated at each extremity, where their width is the same, or very nearly so. The rami of the lower jaw are considerably deeper than in the *P. vulpina*, and the *symphysis menti* forms a more obtuse angle; and, in connection with this difference in the angle formed by the symphysis, we find the lower incisor teeth directed more upwards. All the teeth are larger in proportion than in *P. vulpina,* and in the relative proportions of certain teeth there are differences: thus the anterior upper two incisors are longer in proportion to the other two pairs, and the principal premolar is larger in proportion to the true molars, being equal in length, and nearly equal in width, to the foremost true molar. The anterior margin of the post-palatine opening is on a line with the middle of the first true molar.

The adult skull, according to M. Temminck's figure, is four inches and one line in length, and two and a half inches in width. The two skulls alluded to as being in the British Museum collection yield the subjoined dimensions: those in the first column are from a nearly adult skull; those in the second are from the skull of a young animal, in which only two of the true molars are perfectly developed: in both skulls there are two small teeth immediately behind the lower incisor, the foremost of which, I suspect, represents the lower canine:—

	Inches.	Lines.	Inches.	Lines.
Total length of skull	?*		3	1½
Width	2	2	1	10½
Length of nasal bones	1	3⅓	1	0¼
Width of ditto behind	0	6⅓	0	6
" " in front	0	6	0	4¼
Length of palate to the posterior palatine opening	1	0½	0	11½
" principal premolar and four true molars, taken together	1	2⅓	?	
" lower jaw	2	7	2	2¾
Height of do. from apex of coronoid process	1	4	?	
Depth of ditto beneath the second true molar	0	6½	0	5

Ursine Phalangers, according to M. Temminck, are very numerous in the dense woods of the southern parts of the Island of Celebes. The inhabitants of that island are acquainted with no varieties of this animal: it is said to eat flesh. These Phalangers are seen but little during the day, at which time they squat on the branches of the trees, and are hidden by the foliage.

With regard to these Phalangers eating flesh, I must observe, that this is not likely to be their ordinary food. We know that other Phalangers feed chiefly upon vegetable substances, though they do not refuse flesh, at least when in confinement.

PHALANGISTA (*Cuscus*) CHRYSORRHOS.

Yellow-rumped Phalanger.

Phalangista chrysorrhos. TEMMINCK, Monographies de Mammalogie, t. i. p. 12.

" " WAGNER, in Schreb. Saug. 109-110 Heft, p. 70.

Fur short, dense, and of a cotton-like texture; general colour ashy grey, somewhat suffused with black on the back, and

* According to the proportions of other skulls of *P. ursina*, the length of this one should be 3″ 7‴: the back part is broken in this specimen.

paler on the head; ears well clothed with white hairs: rump and upper surface of tail golden yellow; under parts white: a blackish longitudinal band on the flanks.

Inhabits Amboyna.

The author has never seen this species, of which very few specimens have been brought to Europe. It is described by M. Temminck as being equal in size to the Wild Cat (*Felis Catus*), as having the muzzle short, and with the upper surface on a line with the forehead; the ears very short, hidden by the fur, and clothed throughout with hair; the tail about equal in length to the body (not including the head), covered with fur above, and on the sides, for about two-thirds of its length; the remaining portion naked, wrinkled, and of a yellowish colour; the fur short, close, and woolly; the longer silky hairs of the same colour as the ordinary fur: the fur of the head of a pale ashy grey colour, but that on the ears whitish; the upper parts of the body, the flanks, and the outer side of the limbs, ashy grey, more or less suffused with black; the rump and upper part of the tail, of a golden-yellow tint, brighter in the adult animal than in young individuals; the inner side of the limbs, and the under parts of the neck, white; the chest, and mesial line of abdomen, also white; the white of the abdomen separated from the grey of the flanks by a black band, in adult specimens, but with the band indistinct in the young; the region of the pouch of a rusty tint; the feet of a bright rust colour; the tip of the nose brown; the claws yellowish brown. Full-grown specimens measure, from the tip of the muzzle to the root of the tail, about 23 inches; tail, 13 inches.

The dimensions of an adult skull, according to the figures given by M. Temminck, are—

	Inches.	Lines.
Length from posterior boundary of glenoid cavity to apex of intermaxillary bones	3	0*
Width	2	2
" between orbits	0	8
Length of nasal bones	1	3
Width of ditto at the base	0	6
" " at the apex	0	3¼
Length of palate, to anterior margin of post-palatine openings	1	1
From front of foremost incisor to principal premolar	0	9¾
Length of principal premolar and four true molars, taken together	1	2

The principal premolar tooth of both jaws is represented in the skull figured by M. Temminck, as having the crown higher than in the corresponding tooth of *Phalangista ursina*, and as terminating in a conical point: the canine tooth more advanced, and the foremost canine-like premolar more distinctly separated from the other teeth: the corresponding tooth in *P. ursina* is placed close to the principal premolar, whilst in *P. chrysorrhos* it is separated by a space of about one line in width. The forehead of the skull is much arched. There are two small premolars in the lower jaw.

* The skull has the hinder part fractured; hence the total length cannot be given.

Fur dense and woolly, of a dirty white colour, and irregularly clouded or spotted with brown or black; under parts of head and body white.

Inhabits the islands Amboyna, Waigiou, Banda, and New Guinea.

This species is subject to considerable variation in its colouring, and this is not only due to age, but M. Temminck, who has examined many specimens, informs us that he can perceive slight differences in the hue of the fur of individuals brought from different islands. The author just mentioned describes the ***P. maculata*** as being rather smaller than the two preceding species. Its tail is nearly equal to the head and body in length; about half is clothed with fur, the remaining (naked) portion is covered with ridges, and is of a yellowish colour. The ears are small, well clothed with fur, and hidden; the forehead is arched; the tip of the muzzle is naked and black. The fur is short, dense, and woolly, and intermixed with the ordinary fur are some longer hairs, which are longest and most abundant in the young animal. On the upper parts of the body the fur is usually of a dirty yellowish white tint, but exhibits numerous irregular blotches of dark brown: the face is covered with coarser hairs, and these are of a yellowish, and sometimes rusty yellow tint: on the head and sides of the neck, the hairs of the fur exhibit a mixture of whitish and grey, but the tuft which covers the ears is generally white: the chin, as well as the whole of the under parts of the body, and inner side of the limbs, are pure white; usually immaculate: the feet are of a bright rust colour. The hairy portion of the tail is white; sometimes exhibits a few dark spots, but is usually uniform in tint. The claws are yellowish. The eye is represented in the figure given by Messrs. Lesson and Garnot, as being of an orange colour, and with a vertical pupil. Sometimes the upper parts of the body

and outer side of the limbs are covered with numerous irregular patches of dirty white and dark brown, and the lighter and darker parts are of about equal proportion.

In the young, the dark and light parts are less defined, owing to the longer interspersed hairs being very numerous, and of a dark colour on the light parts of the ordinary fur, and whitish on the dark patches. The ground colour, moreover, in the young, is sometimes of an ashy brown tint; and, finally, very young specimens are said to be entirely of an ashy grey hue.

In the adult animal the lower jaw presents two small teeth on either side, between the great incisors and the principal premolar, and in the young there are three of the small teeth, besides which there is a very small tooth immediately in front of the principal premolar, which is wanting in the adult.

The length of an adult animal, measuring from the tip of the nose to the root of the tail, is about 20 inches; the tail is about 17 inches. An adult specimen, preserved in spirits, measures very nearly three feet in total length, including the tail, which was nearly 18½ inches; about 10¾ inches of which, on the upper surface, was covered with fur, and but 4¾ inches on the under surface was similarly clothed.

The skull of the adult, according to M. Temminck's figures, is—

	Inches.	Lines.
In length	3	10
Width	2	5
" between orbits	0	8
Length of the nasal bones	1	5
Width of ditto at the base	0	6¼
" " at the apex	0	4
Total length of palate	1	11
Length of posterior palatine openings	0	9
From front of anterior incisor to the same part of principal premolar	0	9¼
Length of premolar and four true molars, taken together	1	2½

Like others of the genus, the ***P. maculata*** lives in trees: its flesh is eaten by the natives of the islands in which it is found, and is said to be well-flavoured.

Messrs. Lesson and Garnot state that they were not successful in keeping alive some specimens which they purchased of the natives in the island of Waigiou. These animals were slow and dull, were constantly licking the naked parts of the feet and tail, and rubbing the face with the former; drank much; ate bread, which they held in their hands, but preferred meat. When two were placed together, they fought with fury: upon being in the slightest degree disturbed they growled like a cat, and when provoked they seized with their hands, and endeavoured to bite, those who irritated them. Their great red eyes, surmounted by a thick eyelid, gave them a stupid aspect. In a specimen dissected, the cœcum was found to be very ample, being about 18 or 19 inches in length. The stomach was filled with a green substance, apparently vegetable remains.

Cuscus macrourus. LESSON et GARNOT.

General colour ashy grey, clouded with brownish; under parts white.

Messrs. Lesson and Garnot state that this species approaches very nearly to the ***P. maculata***, but they consider themselves authorised in separating it as a distinct species, on account of its small size, the form of the head, and the size of the tail, as compared with the proportions of the body. It is about 13¾ inches in length from the tip of the nose to the root of the tail; the tail is about 18½ inches in length, and densely clothed with fur for rather more than 10¾ inches of its length. The head is three inches in length. The ears are more prominent than in the ***P. maculata***, and clothed with white hairs

internally and externally; the forehead and upper surface of the muzzle are on the same plane; the muzzle is pointed and attenuated; like the forehead it is clothed with rust coloured hairs; the eyes are encircled with brown. The body and outer side of the limbs are of an ashy grey colour, clouded with brown; the throat and under side of the neck are white, and the abdomen and inner side of the thighs are impure white. The hairs covering the toes are black; the nails yellow; the fur of the tail is of an ashy reddish tint, and somewhat dusky towards the naked part.

Of the ***Phalangista macroura*** Messrs. Lesson and Garnot state that they had only seen one specimen. Now that specimen, excepting in having the tail longer in proportion to the body, it would appear resembles the young of ***P. maculata***, and the describers should have informed us whether the dimensions were taken from a stuffed specimen or not, and whether the conditions of the skull and teeth indicated that the animal was adult.

This species is equal to the Common Rabbit in size: its fur is rather short, dense, moderately soft, and has a slight silky lustre. The male specimens are perfectly white, even when young, but in aged individuals the fur is somewhat tinted with yellowish; the naked portions of the tail, and of the feet, ears, and muzzle, are of a livid white hue, and so are the nails. The females vary considerably in tint, but may be always distinguished by a dark band, which, commencing on the forehead, runs along the back, and terminates before reaching the tail. This band is generally of a chesnut brown colour. In adult females the fur varies, according to Temminck, from yellowish brown to nut brown, or to grey brown, more or less mixed with ash colour. In the young female, the fur is more or less tinted with rust colour, but is slightly suffused with ashy grey, and sometimes is silvery or whitish. The chin, and the whole of the under parts of the body, as well as the inner surface of the limbs, are white, slightly tinted with pale grey; the region of the pouch is rust coloured; the naked portion of the tail is yellowish in the adult, and whitish in the young.

The ears in the *P. orientalis* are not hidden by the fur of the head, as in other species of the *Cuscus* section, and they differ, moreover, in being naked on the inner side. The forehead is concave—rendered so partly by the prominence of the two temporal crests. The tail is about equal to the body in length. In full-grown animals the head and body together measure about 21½ inches in length, and the tail is about 15¼ inches. They rarely attain the total length of three feet three inches (tail included), according to M. Temminck. The females are rather smaller than the males, the largest being about 32 inches in length.

Besides the ordinary well-developed teeth, there is a very small tooth on each side of the upper jaw, situated immediately in front of the principal premolar, and the large

inferior incisors are followed by three small teeth; thus differing from the adults of other species of *Cuscus*, where there are but two small teeth on either side of the lower jaw, behind the great canines.

The dimensions of the skull, figs. 7, 8, and 9, Plate 1 of Temminck's Monograph, are as follows:—

	Inches.	Lines.
Total length of skull	3	5
Width	2	2¼
" between orbits	0	6½
Length of nasal bones	1	3½
Width of ditto behind	0	5½
" " in front	0	3¾
Total length of palate	1	11⅓
Length of posterior palatine openings	0	9⅓
From apex of intermaxillary bones to principal premolar	0	10½
Length of principal premolar and four true molars, taken together	0	11⅔

In a specimen forming part of the Zoological Society's collection, the upper parts of the body are of a pale ashy brown colour, and the head rusty yellowish; the under parts dirty yellowish white: a deep brown line runs along the top of the head, and extends nearly the whole length of the back; woolly fur, like that of the body, covers about five inches of the upper surface of the tail, and terminates in a point; on the under surface it is less extended by about two inches; the rest of the tail is naked.

	Inches.	Lines.
Length from nose to tail	17	0
" of ear	0	6
" of tail	13	0

Of two stuffed specimens in the British Museum, one is perfectly white; the other, which is young, is of a pale rusty brown colour: neither have any mark on the back, and they are, therefore, both probably males.

Geoffroy, supposing the sexes of the present animal to be distinct species, gave to them the names *rufa* and *alba*, neither of which names is appropriate when applied to the opposite sex to that which received it; hence it is, we presume, that Temminck, in his "Monographies," proposed the new name *cavifrons* for our animal. We think, however, he might, without impropriety, have restored the old name of *orientalis*, which Pallas had applied to it as early as the year 1766.

The earliest notice of the *Phalangista orientalis* is that of Valentyn[1], who describes it under the name *Coes-coes;* the name by which it is known to the natives of Amboyna. It is described in great detail by Buffon, in the article headed "Phalanger femelle[2];" but this author committed an error in giving the *Phalangista maculata* as a variety of his animal —an error which is copied by Schreber, and several other authors. Messrs. Lesson and Garnot state, that the *P. orientalis* (*Cuscus albus* of their work) is abundant in New Ireland, where it is called *Kapoune* by the natives: that it is slow in its movements, and, like others of the genus, lives upon trees; and notwithstanding the care which the animals take to conceal themselves, they are discovered by a fœtid odour which they emit. Often, in traversing the forests of this island, the scent of the Cuscus was distinctly perceptible to the authors. It is stated by Cuvier, that when the Phalangers see any person, they suspend themselves by the tail, and, if looked at steadfastly, they will drop to the ground through fatigue[3]; and Messrs. Lesson and Garnot suppose

[1] Omstandig Verhaal van de Geschiedenissen en Zaaken, in Amboina, vol. iii. p. 272, (accompanied by a bad figure). Fol. 1726.

[2] Hist. Nat. xii. p. 108, Pl. 10.

[3] I find a similar statement in the work of Valentyn, already alluded to, whence Cuvier probably learned the fact. Possibly the *Cuscus* may have some kind of instinct allied to that of the North American Opossum, which induces it to feign death when in danger.

that it is by such means the numerous specimens were procured which were daily offered to them by the natives. The Phalangers were brought alive, but with the legs broken, and a piece of wood thrust into the mouth to prevent their biting[1]. The natives are extremely fond of the flesh of these animals, which is very fat, and they cook the Phalangers entire (removing only the intestines) upon peat coals. The teeth of the animal are strung together by the natives to form ornaments for their war implements, as well as to adorn their persons.

Section 2. *Trichosurus.*

Trichosurus. LESSON, Dict. Cl. d'Hist. Nat. t. xiii. p. 333. 1828.
Phalangista proper of TEMMINCK, LESSON, GRAY, and some other authors.

Tail densely clothed with fur, with the exception of a part of the under surface, commencing at the point, and more or less extended towards the root of the tail: ears distinct, usually long; eyes with the pupil round: fore feet normal (*i. e.* with no marked separation of the two inner from the three outer toes): cœcum very long[2].

The species of this section inhabit Australia: their fur is longer and less dense than that of the Phalangers of the islands north of Australia. In specimens of *P. vulpina*, living in the menagerie of the Zoological Society, I observed that the pupil of the eye was round, and not narrow, and nearly vertical, as in the species of the *Cuscus* section; but I

[1] In so hot a climate, were animals not brought alive to the market, they would too soon become unfit for food.

[2] In *Phalangista vulpina* the cœcum was found to be 25 inches in length, in an animal measuring 19 inches; Mr. Martin gives 16½ inches as the length of the cœcum of a specimen, the anatomy of which he describes in the Proceedings of the Zoological Society for 1836—the animal measuring 20½ inches from the tip of the nose to the root of the tail.

must observe, that the iris of the eye was of so dark a colour, that I could scarcely distinguish the pupil from that part. In Cuscus the iris is of an orange colour, or red.

PHALANGISTA (*Trichosurus*) VULPINA.

The Vulpine Phalanger.

(*Plate* 9, fig. 1.)

Didelphis vulpina. SHAW, General Zoology, vol. i. Part 2, p. 503. 1800.
" *lemurina.* SHAW, l. c. p. 487, Pl. 110.
Phalangista vulpina. DESM. Nouv. Dict. d'Hist. Nat. tom. xxv. p. 475 (1817); Mammalogie, Part i. p. 267. 1820.
" " TEMMINCK, Monographies de Mammalogie, tom. i. p. 5. 1827.
Phalangista melanura. WAGNER, in Schreb. Saug. Suppl. 111-112 Heft, p. 81. 1842.
" *fuliginosa.* OGILBY, Proceedings of the Zoological Society for September, 1831, p. 135.
" *Cuvieri* (Gray). WATERHOUSE, in Naturalists' Library; Marsupialia, p. 268. 1841.
" *felina.* WAGNER, in Schreb. Saug. Suppl. 109-110 Heft, p. 76. 1842.
Phalanger de Cook. F. CUVIER et GEOFF. Mammifères, Plate 45. 1821.
Vulpine Opossum. PHILLIP, Voyage to Botany Bay, p. 150, Pl. 16. 1789.
Wha Tapoa Roo. WHITE, Journal of a Voyage to New South Wales, p. 278, and Plate. 1790.

Fur long; general colour grey: under parts of body pale yellow, or yellowish white: muzzle and chin blackish: ears nearly naked on the inner side, having but a few scattered pale hairs; externally well clothed, excepting at the point, with whitish hairs, but with a large black patch at the base: feet yellowish, more or less suffused with brown: tail bushy, black, excepting at the base; the apical third naked beneath: chest almost always with an oblong patch of deep rust-coloured hairs.

Inhabits New South Wales, Western Australia, and North Australia.

The Vulpine Phalanger is about equal in size to the Common Cat; its ears are long, and somewhat pointed; the tail is about equal to the body in length. The fur is long, loose, and moderately soft to the touch; its general colour is grey, the visible portions of the hairs being partly black and partly white; on the back the fur assumes a somewhat deeper hue than on the sides of the body, owing to there being very long black hairs rather plentifully interspersed with the ordinary fur on that part. The muzzle and chin are blackish, but the former is pale near the tip, and the naked muffle is of a whitish flesh colour. The eyes are encircled with blackish hairs; the ears are almost naked within, and of a brownish pink colour, but there are a few scattered pale hairs on this part; on the outer side, excepting near and at the point, and a narrow space along the anterior margin, they are clothed with a dense and moderately long fur, which is white at the posterior angle of the ear and towards the apex, but black elsewhere. The hairs of the moustaches are long, numerous, and black, and there are a few long, black, bristly hairs springing from above the eyes. The throat, as well as the whole under parts of the body and inner sides of the limbs, are of a pale buff-yellow tint, but on the chest is a large oblong patch of deep rust-coloured hairs. The feet are yellowish white, but more or less suffused with brown on the toes; the posterior part, and the outer side of the hind feet, are often dusky; the naked soles of the feet are flesh-coloured; the claws are dusky. The tail is clothed at the root with fur of the same texture and colour as that of the body; beyond, the fur is more bushy, of a harsher nature, and black; the extreme point of the tail, and the under surface of about the apical half, are naked. The region of the pouch of the female (as is very generally the case in the Marsupial animals) is clothed with rusty red hairs.

	Lines.	Inches.
Length from the tip of the nose to the root of the tail	18	0
" of tail	13	0
" from tip of nose to ear	3	2
" of ear	1	11
" of tarsus (claws not included) ...	2	7
" of fore-foot, without the claws	1	11

The foregoing description is taken from a female Vulpine Phalanger in the Museum of the Zoological Society, and will agree pretty closely with most of the specimens which I have seen from the continent of Australia; I have notes, however, of some variations in the colouring of specimens from the main land, which I shall briefly notice.

Var. 1.—This differs from the specimen just described in having the sides of the body chiefly of a bright rusty red hue, and the same reddish tint is observable on the back, though less distinct, the hairs of the fur on this part being reddish below the point, white near the point, and black at the apex: the cheeks and under parts of the animal are of a yellow colour; the feet yellowish white, but the outer side of the tarsus is blackish.—From South Australia. Mus. Zool. Soc.

Var. 2.—Resembles the last, and is from the same quarter, but differs in the rusty hue being paler, and in having the cheeks and feet suffused with a rich brown colour.—Mus. Zool. Soc.

In the British Museum are specimens from the neighbourhood of the River Nammoy, and from that of the Yaroundi, agreeing almost perfectly with my first description. The same might almost be said of a specimen from Perth, but in this specimen the under parts of the body are almost of a pure white, the ears are grey at the base externally, where usually black or dusky; and the rusty chest mark is absent. With regard to the chest mark I must observe, that it varies much

in extent, and is more or less distinct. I have a description of a Vulpine Phalanger, from Port Essington, before me, but, upon looking it over, can perceive no points of the least importance in which this specimen differs from the individual first described. Its fur was rather more dense and crisp.

The dimensions of some of the specimens above alluded to are as follows:—

	PERTH.		YAROUNDI.				NAMOI.	
	Female.		Male.		Female.			
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	19	0	20	0	21	0	17	0
" of tail	11	0	12	0	13	0	10	9
" of ear	1	10	2	1	2	1	1	8
" of fore-foot and nails ...	1	6	1	10	1	11	1	6
" of hind-foot and nails ...	2	4	2	9	2	10	2	3
Width of three upper incisors taken together		3½		3½		4		3½

Numerous specimens have from time to time formed part of the Zoological Society's living collection, and from my own observations they appeared to be by no means intelligent animals. During the day-time they were usually asleep, but towards the evening they became active, and on the alert for their food, consisting of bread and milk, and various vegetable substances, including fruits. Whatever eatable was given to them was taken by, and held between the hands in the same manner as a squirrel holds a nut. Occasionally a dead bird was given to these animals, which were evidently fond of such food, and most particularly the brain, which was the first part consumed.

When in their native haunts they inhabit the large trees (usually the Eucalypti), selecting such as have the heart of

the branches, or trunk, decayed, since it is in the hollows of these trees that they secrete themselves during the day-time. At night they leave these hiding-places, and climb the branches to feed upon the buds, leaves, and fruits, and sometimes they descend to the ground, where they probably find herbs to their taste. Whilst climbing, their prehensile tail assists them to maintain a firm hold of the branches; in captivity I have noticed that in descending from one perch of their cage to another, or to the floor, the tail invariably encircled the perch they were quitting, until the animal was again securely lodged.

Phalangista melanura. Wagner.

The *P. melanura* of Dr. Wagner is founded entirely upon the description and figure of the animal called *Phalanger de Cook*, in the great work of Geoffroy and F. Cuvier. These authors committed a singular error in identifying the animal they describe with the *Phalangista Cookii* of authors, which belongs to a different section of the Phalanger group. The figure alluded to is by no means accurately coloured, if we may judge from the text which accompanies it; and this, it appears to me, clearly refers to the *P. vulpina.*

Phalangista fuliginosa. Ogilby.

General colour brown-black; muzzle, chin, feet, and ears externally, black; throat, chest, and abdomen, of a fulvous brown colour, the last mentioned part of a deeper hue than the chest, &c.

Inhabits Van Diemen's Land.

The animal described by Mr. Ogilby, under the name *Phalangista fuliginosa*, died in the menagerie of the

Zoological Society, and was supposed to be from Sydney, but though numerous specimens of Phalangers of similar colouring and proportions have recently been forwarded to England from Van Diemen's Land, no such animal, to our knowledge, has been sent from Sydney, nor, indeed, from any part of the main land.

The following description is taken from the specimen just referred to.

Ears long, and pointed; tail very bushy, and equal to the body in length. Fur very long, loose, and moderately soft to the touch; its general colour almost black, especially on the back of the animal; but on the sides of the body a rich brown hue is perceptible; and the throat, chest, and under parts, are of a rich brownish fulvous hue, rather deeper on the abdomen than elsewhere The fur on the back is pale brown next the skin; each hair assumes a deeper hue towards the point, and the visible portions of the hairs are black; on the sides of the body there is less of the black at the points of the hairs, the brown below the points is of a richer hue, and is visible; here, moreover, the hairs are many of them annulated, near the point, with rusty yellow, especially towards the shoulders: the chin and muzzle are almost entirely black, as well as the back of the ears, the feet, and the tail. The ears are naked internally, or nearly so; externally they are well clothed with fur, excepting near the point and along the anterior margin, which parts are covered only with small adpressed hairs, as in ***P. vulpina***. About six inches of the apical portion of the tail beneath is naked.

The dimensions in the second column (p. 291) are from an animal, in the collection of the British Museum, which agrees with the above description; it is from Van Diemen's Land, as is also the animal whose dimensions are given in the third column. This latter specimen differs from the former in being of a light grey tint, and, indeed, its colouring corresponds perfectly

with that of *P. vulpina*; I must observe, however, that the fur on the sides of the body is composed of hairs which are of a pale rufous hue, but annulated with white near the point, and black at the point, and that this rufous tint is slightly visible when the hairs are in their natural position. In some specimens from Van Diemen's Land the rufous tint is deeper, and very conspicuous on the sides of the body, and visible even on the back. Others I have seen which were intermediate in their colouring between the deep blackish brown specimens and the grey individuals. On the other hand, I may observe that, although the red hue on the sides of the body is not common in the New South Wales' specimens of *P. vulpina*, yet it does sometimes make its appearance, as may be seen in individuals contained in the British Museum collection; and, from South Australia, I have seen several specimens having the fur of the upper parts of the body of a very distinct rufous grey hue. In the fourth column I have given the dimensions of a beautiful and uncommon variety of our animal, in which the whole of the fur is nearly of an uniform yellow-white, or cream colour; the cheeks and under parts of the body are, however, of a more decided yellow. The specimen, which is in the museum of the Zoological Society, is from Van Diemen's Land. A similarly coloured, but smaller specimen, from the same island, forms part of the British Museum collection.

As the almost black specimens are sent from Van Diemen's Land, accompanied with others, which are of very deep rufous brown tint, much suffused with black on the back; by others, which are of a rich rufous grey; by others, again, which are grey; and, lastly, by individuals which are of a cream colour, and as all these specimens agree very closely in size and proportions, we can but conclude that they form one and the same variable species.

Upon comparing the skins or stuffed specimens of this Van Diemen's Land Phalanger, with those of the *P. vulpina* of New South Wales, the only tolerably constant difference I could perceive was, that the Island animal was rather larger than that of the main land; and two skulls, contained in the Museum of the College of Surgeons, and known to be from Van Diemen's Land specimens, presented a corresponding difference of size when compared with the crania of the *P. vulpina*. I could find no sensible difference of proportion in these skulls, but the dimensions in the next page will speak for themselves.

	Zoological Society.		British Museum.		British Museum.		Zoological Society.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from the tip of the nose to the root of the tail ...	22	0	22	0	18	6	22	0
" of tail	13	0	14	0	12	0	13	0
" from nose to ear ...	3	11	3	8	3	4		
" of ear	2	1	2	0	2	0	2	2
" of hind foot and claws ...	3	5	3	6	2	8	3	4
" of fore foot and claws ...	2	7	2	7	2	0		
Width of three upper incisors taken together		4½		4½		4		

	Van Diemen's Land.				Port Essington.				Habitat uncertain.					
									1		2		3	
	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines
Length of skull	3	9½	3	9	2	11	2	10½	3	6½	3	4	3	1½
Width	2	3	2	3	1	9	1	10	2	2¼	2	0¾	1	11
" between orbits		5½		5		5		5		5		6		5½
Length of nasal bones	1	5½	1	5⅓	1	1½	1	1¼	1	5⅗	1	4	1	3
Width of ditto behind		8½		8¼		6¼		6¼		8⅓		6¾		7
" " in front		3¾		3½		3¼		3		4		3¾		3
" of three upper incisors, taken together		4				3⅔		3⅗		4¼				
From front of foremost incisor to principal premolar		11½				10		10		11¼	1	0		11
Length of the five molar teeth, taken together	1	0½	1	0⅓		9⅖		10¼		11		11		11

(1) Dimensions of a skull in the Hunterian collection; (2 and 3) skulls in the museum of the Zoological Society, entered as from specimens of *Phalangista vulpina*, which died in the Menagerie.

A skull of *P. vulpina*, in Mr. Gould's collection, which is from the Swan River district, measures 3″ 3‴ in length, and 1″ 11½‴ in breadth; and in the Hunterian collection is a skull, the proportions of which are almost precisely the same, being 3″ 3‴ in length, and 2″ 0‴ in width. It is to be

regretted that our collections do not contain well-authenticated skulls of *P. vulpina* from New South Wales.

A series of specimens of the Phalangers under consideration, accompanied with their skulls, both from New South Wales and from Van Diemen's Land, is required to enable us to determine, in a satisfactory manner, whether the animals called *vulpina* and *fuliginosa* are specifically identical. The evidence which I have been able to collect leads me to believe they are, and that we must attribute the difference of size (which is but little), and the great tendency to variation in colouring, on the part of the Van Diemen's Land animal, to local causes—such as food and climate.

Phalangista Cuvieri. Gray.

I formerly thought, with Mr. Gray, that a certain specimen of Phalangista, to which that gentleman gave the name *Cuvieri*, was specifically identical with the *Phalanger de Cook* of Geoffroy and F. Cuvier, and distinct from other species; but upon re-examination of the specimen in question I have changed that opinion, so far as relates to its being a distinct species. It *may* be identical with the "Phalanger de Cook," but I suspect that that animal will prove to be the *P. vulpina* of the Continent of Australia, whilst the *P. Cuvieri*, I think, should decidedly be associated with the island variety, or species, whichever it may be—the *P. fuliginosa*, *P. Cuvieri*, differing from *P. vulpina* in having the feet larger, as well as the upper incisor teeth, and in these parts agreeing perfectly with the *P. fuliginosa*, from the grey specimens of which it differs only in being paler, and in having the tail less bushy; but, with respect to these differences, I must observe that the animal had lived in confinement for some time previous to its death, and when it died it

had shed the greater portion of the longer and coarser hairs of the fur; and it is the dark points of these hairs which give the deeper general hue to specimens which are in better condition.

Phalangista felina. WAGNER.

This animal is described as being of the same size as *P. vulpina*, and of a rusty-red colour, but with the back suffused with black; the ears externally, as well as the lips and feet, blackish; the tail bushy, cylindrical, and perfectly black.

	Inches.	Lines.
Length from tip of nose to root of tail ...	23	0
" of tail	15	9
" ear	2	2

It is said to be from New Holland.

According to the dimensions given, the animal is rather larger than the *P. vulpina*, and agrees in size with *P. fuliginosa*, with some of the varieties of which it also agrees in colouring. I cannot think it is a distinct species.

PHALANGISTA XANTHOPUS.

Yellow-footed Phalanger.

Phalangista xanthopus. OGILBY, Proceedings of the Zoological Society for Sept. 1831, Part I. p. 135.

Fur loose and soft, of a deep grey colour above, having a considerable admixture of black, especially on the hinder parts *of the back; under parts of body and feet yellowish white,* **the fingers suffused with brownish: muzzle, above dusky brown, at the sides sooty; chin dusky; ears naked within; externally, densely clothed with fur of a dirty white colour,**

but with a large dusky patch at the base: tail shortish, grey at base, black beyond, excepting about two inches of the apical portion, which is white: chest with a deep rust-coloured mark.

Inhabits Australia: the exact part not known.

The above description is taken from a specimen in the museum of the Zoological Society, which is the original of Mr. Ogilby's description in the Proceedings above referred to. Its dimensions are as follows:—

	Inches.	Lines.
Length from nose to root of tail	16	0
" of tail	10	6
" from nose to ear	2	9
" of ear	1	8
" of tarsus	2	0
" of fore-foot	1	1

I have never seen a second specimen of this species, which in most respects very closely resembles the *Phalangista vulpina*, but differs in having the apical portion of the tail white.

I cannot regard this as a well-established species; other specimens are required for examination, and above all, it would be desirable to examine its skull and dentition. With regard to the white tip to the tail, I must observe, that I have seen specimens of the *Petaurus breviceps* (an animal of the same family), in which the tip of the tail was also white, though it is usually black in that animal[1].

In the catalogue of the Sydney Museum, I find "the interior of Australia, from Iron-Bark Range, near the Glenelg River," given as the habitat of *Phalangista xanthopus*.

[1] In some packages containing about fifty or sixty skins of *Petaurus breviceps*, there were two or three specimens which differed in no way from the others, excepting in having the tail tipped with white.

The present section contains but two well determined species, and these are distinguishable from the species of the preceding section by their having the tail clothed with comparatively short hairs, the toes of the fore-foot being nearly equal in length, and divided, the inner two from the outer three, so as to be, to a certain extent, opposable to them. The second and third toes of the hind feet are not only united to the extremity (or very nearly so), but the latter toe is united to the fourth for about one-half its length. The inner toe, or thumb, is longer than in *P. vulpina*, extending, when directed forwards, very nearly to the extremities of the second and third toes, whilst in *P. vulpina* the thumb terminates on a line with the base of the same toes, and in this last mentioned animal the third toe is scarcely joined to the fourth. The very broad and short ears form another distinction for the present section, and lastly may be noticed the difference in the molar teeth. The dental formula in *P Cookii* (the type of the section) is, incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; premolars, $\frac{3-3}{3-3}$; true molars, $\frac{4-4}{4-4}=38$. Of the premolars enumerated, there are $\frac{1-1}{2-2}$ which are small and unimportant, but the second of the three upper premolars is a well-developed tooth, and is contiguous with the third, which corresponds to the tooth which I have called the principal premolar. The incisor teeth are proportionately smaller than in *P. vulpina*, and the foremost pair of the upper series are but little larger than the others.

Ogilby. The name *Trichosurus* was orginally used by M. Lesson to distinguish the Australian Phalangers, having hairy tails, from the naked-tailed species of the Indian Islands, and consequently includes, besides the *P. Cookii*, the *P. vulpina* and *P. nana*.—See Dictionnaire Classique d'Hist. Nat. tom. xiii. p. 333, 1829. As *P. Cookii* and *P. nana* have since been made the types of new genera, or subgenera, we must restrict Lesson's sectional name to the Phalangers of which *P. vulpina* is the type.

PHALANGISTA (*Pseudochirus*) COOKII.

Cook's Phalanger.

Phalangista Cookii.	DESMEREST, Nouv. Dict. d'Hist. Nat. xxv. p. 478. 1817.
" "	TEMM. Monogr. de Mamm. tom. i. p.
" *viverrina.*	OGILBY, Proceedings of the Zoological Society for Nov. 1837, Part 5, p. 131.
" *Banksii.*	GRAY, Annals of Natural Hist. for April, 1838, vol. i. p. 107.
Phalanger de Cook.	CUVIER, Règne Animal, tom. i. p. 179, ed. 1817; tom. i. p. 183, ed. 1829.
? *Phalanger de Bougainville.*	CUVIER, Règne Animal (1829), p. 183.
New Holland Opossum.	PENNANT, Hist. of Quad. vol. ii. p. 301. 1781.
White-tailed Opossum.	SHAW, Gen. Zool. vol. i. Part 2, p. 504. 1800.

Ring-tailed Opossum of the Colonists.

Fur long and soft: upper parts of body grey; flanks, and outer surface of limbs, suffused with bright rust-colour; under

parts white, or yellowish white: ears well clothed externally, and the fur on this part dusky, excepting towards and at the posterior angle, where it is white, or yellowish: tail coloured like the body at the root, then black, and at the apex, white.

Inhabits New South Wales.

The *Phalangista Cookii* is about one foot, or rather more, from the tip of the nose to the root of the tail; its tail is about equal to the body in length. The ears are broad, but short and rounded, nearly naked on the inner side, and densely clothed on the outer surface, if we except a narrow space next the apical margin. The legs are short. The fur is rather long and dense, and moderately soft to the touch; on the upper parts of the body its general tint is pale grey, obscurely tinted with rust-colour; on the head, sides of the body, outer side of limbs, and under part of the tail at the base, a rusty yellow hue prevails: the chin, throat, and under parts of the body, as well as the inner surface of the limbs, are white, or yellowish white: the sides of the muzzle are blackish; the fur on the back of the ear is chiefly of the same blackish hue, but on the hinder part it is white (sometimes rusty white), and there is a small patch of white hairs on the side of the head immediately joining the posterior angle of the ear. The tail is clothed with fur like that of the body at the root, but receding from this part the hairs soon become harsher, shorter, and closely applied to the skin; these adpressed hairs are black on the middle of the tail and white at the tip: the longitudinal extent of the part of the tail which is clothed with white hairs varies considerably in different individuals. The apical third of the tail is naked beneath. The feet are of a pale rust colour, or sometimes brownish in the middle, and nearly white at the sides.

The present species of Phalanger was discovered in Cook's

first voyage by Sir Joseph Banks, and originally described by Pennant, from a specimen brought home by that gentleman[1]. During Cook's last voyage a second specimen was procured, and is figured in one of the plates illustrating the account of that voyage[2]. This second specimen was found at Adventure Bay, in Van Diemen's Land, whilst the first was from Endeavour River, on the north-east coast of the continent of Australia.

Subsequently specimens were brought to Europe by some of the French expeditions, and being recognized as the animal figured in Cook's voyage, the species was named after our celebrated navigator—I believe originally by Geoffroy. More recently, Mr. Ogilby, observing that a specimen sent to the Zoological Society from Van Diemen's Land differed in its size and colouring from others which he had examined, and which were known (some at least) to be from the main land, was induced to found a new species, under the name of *P. viverrina*, upon the Island specimen, retaining the name *Cookii* for the continental animal. Mr. Gray was also of opinion that the Van Diemen's Land and the continental Ring-tailed Phalangers were distinct, and proposed to name the one, originally discovered at Endeavour River, *P. Banksii*, and that from Van Diemen's Land, *P. Cookii*[3]. Mr. Gray has since changed his opinion, associating the Ring-tailed Phalangers under one specific name, and I find that Dr.

[1] See Hawkesworth's Voyages, vol. iii. p. 586.

[2] Cook's Third Voyage, first edition (1784), vol. i. p. 109, and Pl. 8.

[3] See Annals of Natural History, vol. i. p. 107. In the same volume will be found a discussion between Mr. Gray and Mr. Ogilby, relating to the nomenclature of these two supposed species; this discussion I do not think it necessary here to enter into, since I regard the animals as specifically identical. I will merely observe, that they were first separated by Mr. Ogilby, and that the specimens which first received the name *Cookii* by Geoffroy and Desmarest, agree in their colouring with the rufous-grey specimens of New South Wales.

Wagner, in his continuation of Schreber's great work upon Mammalia, likewise associates the animals named *P. Cookii* and *P. viverrina*.

It is certain that amongst the extensive series of these animals now in the British Museum collection, there are specimens from the continent of Australia which agree in their colouring with the *P. viverrina*, and on the other hand, amongst those from Van Diemen's Land, there are individuals which have the same pale grey hue as the *P. Cookii* of Desmarest.

As in the case of the Vulpine Phalangers of Van Diemen's Land, the Ring-tailed species in that island varies considerably in its colouring, often assumes a dark, sooty hue, and is sometimes white, or cream-coloured, whilst the specimens from New South Wales vary but little: from the opposite coast, however, I have seen several specimens which were fully as dark as any found in Van Diemen's Land. I will now notice some of the varieties of *Phalangista Cookii*, first observing that all the animals of this species which I have seen, have a conspicuous white, or yellowish white, fringe of hairs around the hinder angle of the ear, and the apical portion of the tail white: sometimes less than a quarter of the tail is white, and sometimes more than half. The tail is often black, or nearly so, on the part immediately preceding the white portion, and becomes paler, and coloured like the body, at the root.

With regard to the New South Wales specimens, I have only to remark, that they almost always agree very closely with the description heading this account. Sometimes the fur is red-grey, and the rusty red on the flanks and limbs is very distinct; in other specimens the upper parts are grey, and the legs and sides of the body are but little tinted with rust colour; and in the young the colouring is always rather darker than in the adult. The specimens from the Swan

River district are frequently very dark: three out of six, which are before me, are almost black on the upper parts of the body, but slightly inclining to grey: the under parts are white, and the muzzle and feet are sooty black. One specimen is brown, slightly suffused with reddish; the body beneath white, tinted with yellow in parts; the feet deep brown. The remaining two are of a pale grey hue on the upper parts of the body, and yellowish white beneath; in one of these specimens the feet are very pale, inclining to white; in the other they are brown.

As presenting the most general features of the Van Diemen's Land specimens, I will describe the specimen in the Zoological Society's collection, which has already been referred to, being the original of the

Phalangista viverrina. OGILBY.

General colour sooty-grey, the dark fur slightly pencilled with whitish on the head and fore parts of the body of the animal, and with brown on the hinder parts; chin, throat, and abdomen, yellowish white: muzzle dusky brown; cheeks paler than on the upper parts of the head, and with a whitish spot situated a little behind the eye: the dense fur on the back of the ear black, excepting at the posterior margin and hinder angle, where it is white: outer surface of the limbs rusty brown; feet black: tail brown-black, finely pencilled with pale brown, of a brownish rust colour at the root, and with the apical third white, excepting on the under surface, where it is naked.

A second specimen, in the same collection, is worthy of notice, differing from the one just described in having the general hue rather darker; the tail black, but with the apical third white; the abdomen grey; the chest white, and a broad white mark extending from the chest to the middle of the abdomen; the chin is dusky at the sides.

In the British Museum collection are five specimens from Van Diemen's Land, in which the general hue of the fur is

pale rufous grey on the back, and bright rust colour on the sides of the body and limbs; of these, three have rusty white feet, and in two the feet are brown: on the cheek of several, is a dusky longitudinal mark, whilst in others the cheeks are almost entirely white. In all, the under parts of the head and body are white, or yellowish white. These specimens, therefore, resemble the individuals found in New South Wales.

The following are the dimensions of some of the specimens alluded to:—

	New South Wales.		*P. Cookii*, Desm., Paris Mus.		Swan River district. Female.		*P. viverrina*. Mus. Zool. Society.		Van Diemen's Land. Male.		Van Diemen's Land. Female.		New South Wales. Female.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	13	6	14	0	15	0	15	0	15	0	14	0	15	0
" of tail ...	12	0	12	6	13	0	13	0	14	0	14	6	15	0
" from nose to ear	2	4	2	1	2	3½	2	5	2	2	2	3	2	2
" of hind foot	1	8			2	0	1	11	2	0	2	0	1	11
" of ear ...		9½		10½		11		11	1	1	1	1	1	0

The subjoined dimensions are from a skull of ***Phalangista Cookii*** in the museum of the Zoological Society.

	Inches.	Lines.
Total length of skull	2	6½
" width	1	4⅓
" " between orbits		3⅓
Length of nasal bones		10¼
Width of ditto at the base		5
" near the apex		3
Length of palate to the anterior margin of the great palatine opening		9½
From front of foremost incisor to principal premolar		6¼
Length of the principal premolar and four true molars taken together		8¾

Phalangista Bougainvillii.

Phalanger de Bougainville. CUVIER, Règne Animal, ed. 1829, p. 183.
Phalangista Bougainvillii. WAGNER, in Schreb. Saug. 111-112 Heft, p. 82. 1842.

Size of a squirrel: upper parts of the body ash-coloured, under parts white; the posterior half of the tail black, and the hinder half of the ear white.

The above short description is from Cuvier, who states that the specimen from which it is taken was brought home by the Baron Bougainville in his last voyage. I strongly suspect it will prove to be the *P. Cookii.*

PHALANGISTA (*Pseudochirus*) CANESCENS.

The Hoary Phalanger.

Phalanger grisonannt. Humbron et Jacquinot, Voyage au Pole Sud, &c. Zoologie—Mammifères, Pl. 16.

Ears very small: two inner toes of the fore foot distinctly opposable to the other three; thumb of hind foot directed back-

wards: general colour grey-brown; under parts of body impure white; sides of face fulvous; upper surface of head with a broad, dusky, longitudinal mark.

Inhabits?

A very distinct species of Phalanger is represented in one of the plates of the work above quoted, but since the letter-press of this great French work is not yet published, or at least has not reached us, I am unable to give any account of the animal beyond such as may be gleaned from the plate. According to the figures, the "Phalanger grisonnant[1]" is evidently allied to the *P. Cookii*, having the same *general* conformation of skull, teeth, feet, and tail; the two inner toes of the fore feet, however, are still more distinctly opposed to the remaining three than in the animal just mentioned, and the thumb of the hind foot is directed completely backwards. The limbs and upper parts of the body, as well as the tail, are represented as of a grey-brown colour, the under parts of the body impure white, the sides of the face yellowish, or fulvous, the upper surface of the head with a broad, dusky, longitudinal mark, and the claws yellow. The ears are proportionately much smaller than in *P. Cookii*.

The young animal is depicted as having a dusky longitudinal stripe along the back.

The size and proportions of the parts should be very nearly as follows:—

	Inches.	Lines.
Length from tip of nose to root of tail ...	12	0
" of tail	11	0
" of ear		5
" of fore foot, including the nails ...		7½
" of hind feet, including the nails ...	1	1
" of skull	2	1½
Width of ditto	1	3½

[1] The authors give no technical name.

The skull is represented as having no posterior palatine openings. The teeth are—incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; molars, $\frac{7-7}{6-6}$: as in *P. Cookii*, there are six contiguous molars on each side of the upper jaw.

Section 4. *Dromicia.*

Dromicia. GRAY, in Appendix to Grey's Journal of two Expeditions in Australia, p. 407. 1841.

Incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; premolars, $\frac{3-3}{4-4}$; true molars, $\frac{3-3}{3-3}$ = 36. Ears moderate, nearly naked, and folded; toes with the nails small; tail, excepting at the base, where it is covered with fur like that of the body, clothed with small adpressed hairs; naked beneath at the extremity.

The little Phalangers composing this section very much resemble the Dormice amongst Rodents, not only in general appearance, but also, to a considerable extent, in habits: they are readily distinguished by the reduced number of their molar teeth, affording a rare exception amongst the Marsupialia in having but three of these teeth on either side of each jaw. The foremost pair of incisors in the upper jaw are larger and longer, in proportion to the other two pairs, than in *Phalangista* proper; the latter teeth are very small; the canines are moderately developed, and situated distinctly behind the intermaxillary suture: these are followed by two minute teeth, separated from each other, and from the principal premolar which follows: this last mentioned tooth is compressed, pointed, and two-rooted. Of the three true molar teeth the first is rather the largest, and the last distinctly smaller than the others; this latter has but three pointed tubercles, whilst the foremost two true molars have each four

pointed tubercles, of which the two on the outer side of the tooth are the largest. The incisors of the lower jaw are narrow, very long, and pointed; they are followed in each ramus of the jaw by three or four[1] small teeth, a principal premolar, and three true molars.

As is very generally the case in the smaller species of a natural group, the skull, to a certain extent, resembles that of the young individuals of the larger species; as, for instance, in the small development of muscular ridges, and proportionately larger size of the cerebral cavity. Such are the chief differences which distinguish the skull of the small Phalangers under consideration from those of the larger species of the group. The auditory bullæ are rather large, and partially divided by an oblique indentation: the palate has four posterior openings. The rami of the lower jaw are comparatively slender, and the inflected angular portion of the jaw is in the form of a slender pointed process.

In *Dromicia concinna* the nails of all the fingers, and of the fourth and fifth toes, are very small, and partially embedded in the upper surface of the fleshy pad which terminates these members[2]. The nails of the second and third, joined, toes of the hind foot are larger, and free: the first toe is nailless as usual. In the living animals the ears are considerably crumpled, and more or less pendant.

[1] In the skull before me, of *Dromicia concinna*, I find even five of these small teeth, but on one side of the jaw only, the other side of the jaw having four.

[2] I presume the same structure is found in *P. gliriformis*, but in dried skins the fleshy pad at the end of the toe necessarily shrinks, and the nails are then free.

PHALANGISTA (*Dromicia*) NANA.

Dormouse Phalanger.

Phalangista nana (Geoff.)	DESMAREST, in Nouv. Dict. d'Hist. Nat. tom. xxv. p. 470. Mammalogie, Pt. 1, p. 268.
" *gliriformis*.	BELL, Transactions of the Linnæan Society, vol. xvi. p. 121, Pl. 13.
" *nana* (Geoff.)	WATERHOUSE, Naturalists' Library, Marsupialia, p. 279.
Dromicia gliriformis.	GRAY, in List of the Mammalia in the British Museum, 1843, p. 85.
" "	GOULD, Mammals of Australia, Pl. 8.

Fur very soft, and moderately long; general colour ashy grey, suffused with pale reddish brown; under parts white, tinted with rusty yellow on the chest; hind feet white; fore feet grey; ears large; head rather paler than the body, dusky round the eye; tail very thick at the base, where it is clothed with fur like that of the body; the remaining portions very scantily clothed.

Inhabits Van Diemen's Land.

I had the pleasure, a short time since, of examining three or four living specimens of this interesting little animal in the menagerie of the Zoological Society. Very fat, and sluggish—during the day-time at least, I was struck with their resemblance to the Dormouse, but, as Mr. Bell correctly observes, they are broader, more depressed, and larger. That gentleman's accurate description, made from living specimens, I cannot improve, and shall therefore give in his own words—omitting only some few of the less important parts. "The head is broad across the ears, from whence it tapers to the nose, which is somewhat pointed; the nostrils are narrow, and of a semicircular form; the upper jaw, which is elongated, overhangs the under, and almost entirely conceals it; the eyes are very large, remarkably prominent, and of a

jet black colour: the ears are of considerable size, erect[1], totally destitute of hair, and of an uniform mouse colour; the fur is very soft and thick, and its general hue is rufous grey; the under parts are more sparingly covered with fur, of a pale yellowish grey colour, the yellow predominating at the sides, and especially on the throat; the general colour of the face is also yellowish; the sides of the neck, as well as the throat, are buff; there is a blackish ring around the eye, and a darkish ring partially surrounds the ear at the anterior part, interrupted by a distinct white spot behind; the feet are almost entirely concealed by the fur, both when the animal is at rest, and when in an active state. The breadth of the body, combined with the length of the fur, and the extent to which the skin of the sides is attached to the legs, namely, as far as the carpi and tarsi, gives it very much the appearance of a *Petaurus*, to which this species evinces a remarkable approximation. The tail is nearly as long as the head and body together, and is remarkably broad and thick at the base, to more than half an inch from the origin, at which part it becomes contracted, and then gradually tapers to the extremity; it is hairy, being more thickly covered on the upper part, and especially at the base, where it partakes of the general colour of the upper parts of the body, becoming more scantily furnished towards the point, and there is on the under part, at the extremity, a space of about half an inch in length, which is entirely naked; the tail is more or less prehensile throughout its whole length, but especially towards its extremity."

	Inches.	Lines.
Length of head and body	3	10
" of tail	3	6
Breadth of tail at the root		6
Length of ear		5
Breadth of ditto		5

[1] The ears were always pendant in some specimens which lived in the menagerie of the Zoological Society, and they were not quite destitute of hair, though very nearly so.

The largest of the specimens living in the Zoological Society's Menagerie slightly exceeded in its dimensions the admeasurements above given, and differed from others somewhat in its colouring; its length was a trifle more than four inches measured in a straight line from the tip of the nose to the root of the tail, which was three inches and ten lines in length. The basal portion of the tail was very broad, being about three-quarters of an inch in width, and slightly depressed; at about an inch from the root it became rather suddenly contracted, and thence gradually decreased in diameter to the extremity; it was rather sparingly clothed with palish hairs, which were closely applied to, but did not hide the skin, which was flesh-coloured; the basal, incrassated portion of the tail, was clothed with fur like that of the body, but more closely applied to the skin; about half an inch of the apical portion was perfectly naked. All the naked parts, such as the under parts of the feet, tip of the muzzle, and ears, were of a delicate flesh-colour. The fur was extremely soft, on the upper parts of the body ash-coloured, but suffused with rusty brown, and obscurely tinted with yellowish about the muzzle; the under parts were of palish rusty brown, somewhat darker in hue on the chest. In another specimen the under parts of the body were white, slightly suffused with rusty yellow on the chest; the white of the under parts extended upwards on the sides of the body, where it was separated from the greyish colour of the upper parts by an indistinct dusky mark: the same dusky hue was visible on the outer, or rather towards the hinder parts of the fore legs. This specimen, when dead, gave the following dimensions—the tail was imperfect.

	Inches.	Lines.
From nose to tail, along the course of the back	4	2
From nose to ear		11
Length of tail		8
" of hind foot and nails		6½

The ears in all the specimens were partially folded, the apical portion lopping over. An excellent figure of the present animal, made from life, will be found in Mr. Gould's Mammals of Australia.

The habits of the *Phalangista nana*, Mr. Gould observes, "are extremely like those of the Dormouse, feeding on nuts and other similar food, which they hold in their fore paws, using them as hands. They are nocturnal, remaining asleep during the whole day, or, if disturbed, not easily roused to a state of activity; and coming forth late in the evening, and then assuming their natural rapid and vivacious habits, they run about a small tree, which is placed in their cage, using their paws to hold by the branches, and assisting themselves by their prehensile tail, which is always held in readiness to support them, especially when in a descending attitude. Sometimes the tail is thrown in the reverse direction, turned over the back, and at other times, when the weather is cold, it is rolled closely up towards the under part, and coiled almost between the thighs. When eating, they sit upon their hind quarters, holding the food in their fore paws, which, with the face, are the only parts apparently standing out from the ball of fur, of which the body seems at that time to be composed. They are perfectly harmless and tame, permitting any one to hold and caress them, without even attempting to bite, but do not evince the least attachment, either to persons about them, or even to each other."

Mr. Gould states that the *Dromicia gliriformis* is more particularly abundant in the northern portions of Van Diemen's Land; that of all trees it appears to prefer the Banksias, whose numerous blossoms supply it with a never-ceasing store of food, both of insects and sweets. During the day it generally slumbers, coiled up, in some hollow branch or fissure in the trees. That gentleman has observed, that during the months of winter it is less active, undergoing, in fact, a

kind of hybernation, somewhat similar, but not to the same extent, as in the Dormouse.

It would be interesting to learn whether, during this partial hybernation, the accumulation of fat at the root of the tail decreases. We have instances in two or three other species of Marsupials of an incrassated tail, as in the *Didelphys elegans* of Chili, and the *Phascogale crassicaudata*; but here the tail is not always equally thick, and in the *Didelphys elegans* I have seen specimens in which it was not incrassated, and others in which it was very thick.

As there may be a difference of opinion with regard to the specific identity of the *Phalangista nana* of Geoffroy and the *P. gliriformis* of Bell, I will add a description taken by myself from the original specimen of the *P. nana*, which is contained in the Paris Museum, first observing, that the only difference I could perceive was that of size, Geoffroy's specimen being considerably smaller than the individual described by Mr. Bell; and this difference I think is attributable partly perhaps to age, but more to a tendency which these animals have to attain extreme fatness when kept in confinement.

The *Phalangista nana* of the Paris Museum is about equal in bulk to the Common Mouse; its fur is soft, dense, and of a yellow-grey colour; the head pale dirty yellow; a brown mark runs through the eye: the ears have extremely minute hairs on the outer side, and are naked within: fur like that on the body extends for about three-quarters of an inch on to the tail, and the remaining portion of that organ is covered with very small adpressed hairs, brownish on the upper surface, and pale beneath: the whole of the under parts of the body, and the lips, are whitish.

	Inches.	Lines.
Length from tip of nose to root of tail ...	2	7
" of tail	2	6
" of ear		3½
" of hind foot		5⅓

The specimen was procured by M. Péron at Maria Island, situated close to Tasman Peninsula, Van Diemen's Land.

PHALANGISTA (*Dromicia*) CONCINNA.

Beautiful Pigmy-Phalanger.

Dromicia concinna. GOULD, Proceedings of the Zoological Society for January, 1845, Pt. 13.—Mammals of Australia, Pt. 1, Pl. 9.

Plate 11, Fig. 2.

Fur very soft; upper parts of the body rusty brown, or ashy grey suffused with rust colour; under parts white; a dusky patch in front of eye; feet white: tail with minute brownish hairs.

Inhabits the Swan River district, Western Australia, and South Australia.

This little animal is rather smaller than the common Dormouse (*Myoxus avellanarius*). From the *Dromicia gliriformis* it may be distinguished by its much smaller size, its tail not being incrassated at the base, and its colouring, which is usually of a delicate rusty brown hue on the upper parts of the body, but sometimes greyish, slightly suffused with rust colour only: the white of the under parts is strongly separated, on the sides of the body, from the darker colour of the upper parts; the dark patch in the region of the eye is nearly confined to the anterior angle, but is continued in the form of a narrow line across the upper part.

	Inches.	Lines.	Inches.	Lines.
Length from nose to root of tail ...	3	6	3	7
" of tail	2	10	3	0
" from nose to ear		$7\frac{1}{2}$		
" of tarsus		$5\frac{1}{2}$		$5\frac{1}{3}$
" of ear		6[illegible]		6

In the British Museum collection are three specimens[1] agreeing with the above description; of one of these, the largest, I have given the dimension in the second column, those of the first column being from a specimen in Mr. Gould's collection. A skull removed from one of the Museum specimens is somewhat fractured, and in the first of the admeasurements given below, allowance has been made for the lost, occipital portion.

	Inches.	Lines.
Its length is about		9
The width is		6¾
Total length of palate		5
From front of foremost upper incisor to back of last molar		4¼
Length of lower jaw from condyle to base of incisor		5½
Height of ditto from apex of coronoid process		2¼

According to Mr. Gould, the *D. concinna* is abundantly, and very generally distributed over the colony of Swan River. Its habits being strictly nocturnal, it secretes itself during the day in the hollows of trees, and at night leaves its retreat for the flowering branches of low shrubby trees. At that time it is said to be very active, and when kept in confinement will leap from side to side of its cage in chase of insects, of which it is exceedingly fond. The sexes present but little difference either in size or colouring; in some specimens the under parts of the body are slightly tinted with buff colour.

PHALANGISTA (*Dromicia*) NEILLII.

Neill's Phalanger.

Upper parts of the body grey, under parts white; a black patch in front of the eye; size less than the Common Mouse.

[1] Two of these are from Western Australia, and the third is from South Australia.

The author is indebted to Mr. Neill, Deputy-Assistant Commissary General at King George's Sound, for many interesting notes relating to the Marsupial animals found in the above mentioned part of Australia, and likewise for some specimens of the smaller species, preserved in spirits, which were forwarded with the notes. Amongst these specimens I find the present species of Phalanger, which I have taken the liberty of naming after its discoverer, since it decidedly differs from any of the hitherto described species of the group. One of its most remarkable features is its small size, it being less than either of the two pigmy species just described; and I should not have introduced it into the list of species, had I not satisfied myself, by an examination of its skull, that it was an adult animal, having all the true molar teeth developed. The specimen is a male.

Mr. Neill states that the animal is called Jāā-jat by the *aborigines of King George's Sound, and that it is found* under the dead bark of trees—Eucalypti, &c., and also in holes in trees which have been excavated by fires. "The specimen sent was taken alive by my own hand, and, by dint of care, lived in confinement for upwards of two months, during which time it was fed upon sugar mixed with bread-crumbs. The general colour, when the animal was first caught, was a light azure grey, inclining to steel colour over the whole of the back, the fore legs, and the thighs[1]. The breast and belly were pure white, and the fore legs were also edged with white.

"When in a state of repose the ears of the little animal were pendant, but when startled, or in activity, they were erect: their colour is brownish pink: the upper half of the ear is thinly covered with very fine hairs, the lower half (externally?)

[1] As seen in the clear spirits, the fur on the upper parts of the body appears to be grey, slightly suffused with brownish, and there is an evident dark patch in front of the eye.

of the same grey tint as the body." The natives of King George's Sound, Mr. Neill moreover states, never molest this pretty little creature, either because it is too insignificant for an article of food, or perhaps some superstitious feeling forbids them. They inform him that it feeds upon young shoots of grass, as well as upon the honey of the Banksias, Xanthorœa, &c.

	Inches.	Lines.
Length from tip of nose to root of tail ...	2	3
" of tail	2	7
" of ear		5
" of fore foot		3¼
" of hind foot		5½
" of thumb of ditto		2
" of skull		8½
Width of ditto		6
Length of nasal bones		3
" of palate		4
" from outer side of upper premolar to back of last true molar ...		3¾
" of auditory bullæ		2⅓
" of lower jaw, measured from the condyle to the base of the incisors		4¾
Height of ditto from the apex of the coronoid process		2½

The bones of the skull are thinner than in *Phalangista gliriformis*, and the temporal ridges are scarcely perceptible: the auditory bullæ are large, and the posterior root of the zygomatic arch is much inflated to increase the air-cells of the ear chamber; towards the hinder part of the palate are two oblong openings, each rather more than a line in length, and behind these are two minute round openings The fleshy pads of the hands and feet are distinctly striated in the transverse direction, and on the intermediate spaces are minute tubercles, and each toe is terminated by a fleshy pad having concentric striæ. The tips of the nails do not project beyond these pads.

Genus, *Petaurus*.

Petaurus.	SHAW, Naturalists' Miscellany, Pl. 60. 1791.
"	DESM., Nouv. Dict. d'Hist. Nat. tom. xxv. p. 400. 1818.
Petaurista.	DESM., Mammalogie, Part 1, p. 268. 1820.
Phalangista.	ILLIGER, Prod. Syst. Mamm., &c., p. 78. 1811.

Phalangistidæ having a membrane extended from the fore to the hind leg, and filling the interspace of these legs; the tail well clothed with hair throughout, and generally very long.

The Petauri, or Flying Phalangers, in general appearance greatly resemble the Flying-Squirrels, having, like those animals, a membrane extended between the fore and hind legs, and which serves, to a certain extent, to sustain the animal in the air, when descending from a height, after the manner of a parachute. In some *Petauri* the tail is bushy and cylindrical like the large Flying-Squirrels (*Pteromys*) of India and the Indian Islands; in others (the smaller species) the tail is distichous, and in this respect they resemble small flying-squirrels of the sub-genus *Sciuropterus*.

The dentition of some of the Flying Phalangers greatly resembles that of certain species of *Phalangista*, and M. F. Cuvier, disregarding the external peculiarities presented by the *Petauri*, associates them with the true Phalangers, of which he forms two sections, in each of which are species possessing the flying membrane, and others destitute of this appendage: for these sections he retains the names *Petaurus* and *Phalangista*. In the latter group M. Cuvier associates the animals of the Cuscus section together with the *Phal. vulpina*, and the *Petaurus sciureus* of authors, and in the former group he arranges the *Phal. Cookii*, the *Petaurus taguanoides*, and the *P. macroura*. With regard to the

Petaurus taguanoides and the *Ph. Cookii*, there certainly exists a great similarity in the dentition, but the possession of the lateral membranes joining the anterior and posterior limbs, and a difference in the structure of the feet of the former animal, should not be entirely overlooked; and with regard to the group *Phalangista*, as constructed by F. Cuvier, I have to observe that he is quite incorrect in his statement that the teeth of the *Petaurus sciureus* resemble those of the Cuscus section, or of *Phalangista vulpina*: the teeth in *Pet. sciureus*, indeed, differ more from the Phalangers with which they are associated, than do those of *P. Cookii* from *P. vulpina*. On the whole, the more correct mode, as it appears to me, of expressing the relationship of the flying and non-flying Phalangers, would be to arrange the species of these sections in two parallel series, as in my table at p. 12, though that table would more closely express the parallelism of the group, had the section *Petaurus* been placed opposite *Pseudochirus*, and that of *Belideus* been shifted rather higher, for the animals of this latter section are intermediate in their characters between *Petaurus* and *Acrobata*, and are not represented by any known species of the *Phalangista* genus.

Sub-genus 1. *Petaurista*.

***Petauri* with broad, and rather short, rounded ears, which are densely clothed with long fur on the outer surface; the toes of the fore foot nearly equal in length; the flank membrane extending only to the elbow joint; with seven well developed molar teeth, forming a continuous series on either side of the upper jaw, and six in the lower; the true molars having pyramidal cusps.**

M. Desmarest divides the Petauri into two sections, making

the *P. taguanoides* the type of his first section, to which he gives the name *Petaurista*, and *Pet. pygmæus* the type of his second section. From the first of Desmarest's subdivisions we shall have to separate certain species which differ from his type, and, in fact, it will be necessary to restrict his sectional name to the *P. taguanoides*. The dental formula in this animal is, incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; premolars, $\frac{3-3}{1-1}$; true molars, $\frac{4-4}{4-4}$. The incisors of the upper jaw are arranged laterally, and the three on either side are placed close together; the two foremost, belonging to opposites sides of the jaw, are separated from each other by a narrow space; they are narrow at the base, and wide and somewhat compressed, above the base. The next incisor, on either side, is larger than the posterior one, and about half the height of the first; narrow at the base, and wide and truncated at the apex. The third incisor is small, and but little expanded at the apex. The canine is small, being in size about equal to the posterior incisor; its tip is rounded, and it springs from the maxilla a little behind the intermaxillary suture. The first false molar is minute and conical, separated by a considerable space from the canine, and also from the second premolar, and has but one fang. The next two premolars have two fangs each; they are broad at the base, and compressed at the apex: the foremost presents an anterior larger, and a posterior small and compressed tubercle; the hindermost is divided at the tip into three compressed cusps. The true molars are nearly square, but rather longer than broad; the crown of each, with the exception of the last, presents four angular cusps. In the last there are but three of these cusps; two in front and one behind. The incisors of the lower jaw are large, nearly cylindrical at the base, and somewhat dilated, flattened and pointed beyond, and have two sharp edges. The space between the incisors and principal premolar, I have found edentate in two skulls of *P. taguanoides*, but in a third

skull I noticed a minute tooth in the same part. The single premolar on each side is placed close to the true molars, compressed in front, and expanded behind; a small anterior tubercle is separated from the body of the tooth by a slight transverse incision. The true molars resemble those of the upper jaw, excepting that they are rather narrower, and the last tooth has four, instead of three, cusps. The skull of *Pet. taguanoides* differs from the skulls of the species of the next section, in being smaller in proportion to the bulk of the animal, in having the zygomatic arches stronger, and flattened at the sides, in being deeply concave, and much contracted between the orbits, instead of flat, and in having the palate deeply emarginated behind. The nasal bones are much shorter. The toes of the fore foot are nearly equal in length, if we except the inner toe, which is distinctly shorter than the rest; they are provided with large, curved, and compressed claws, as are the toes of the hind feet, with the exception of the thumb, which, as usual, is nailless. The second and third of the hind toes are joined to the extremity, and the third is joined to the fourth for about half its length. The hands and feet are naked beneath. The Petauri, like the true Phalangers, are nocturnal, and hide themselves during the day in the hollows of trees.

the upper parts of the body are more or less of a dirty white colour.

Inhabits New South Wales.

The Taguan Flying-Phalanger has a short and small head, broad ears, which, with the exception of a narrow space at the apex, are clothed with long dense fur, like that on the head, and a very long, bushy, and cylindrical tail[1]. The flank membrane, which fills the interspace between the fore and hind legs, is attached to the fore leg as far forwards as the elbow-joint, and to the hind leg as far as the base of the inner toe or thumb. The fur of the animal is very long and loose, and soft to the touch: its general colour on the upper parts of the body is brown-black; on the head, and back of the ears, brownish, and on the flank membrane it is pencilled with whitish, though the ground-colour is the same as that of the body: the feet, muzzle, and chin, are almost black; the throat, chest, under parts of the body and flank membrane, as well as the inner side of the limbs, are impure white; the wrists and ankles, however, are black on the inner side as well as on the outer: the long hairs near and at the posterior margin of the ear, are white, or whitish, and project from the edge of the ear in the form of a fringe; the hairs covering the hind feet, and along the back of the leg to the root of the tail, are very long: the tail is of a black, or brown-black colour, but is almost always paler at the root, and along the under surface for some considerable distance from the root; here the hairs are sometimes yellowish brown, and sometimes brown-white.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	20	0	20	0
" of tail	22	0	21	0
" from tip of nose to ear ...	2	2		
" of ear	1	4	1	4
" of hind foot and nails ...	2	2	2	3
" of fore foot	1	11	2	1

[1] The average diameter of the tail, including the fur, is about two inches.

This animal varies considerably in its colouring, and is often of a greyish black hue on the upper parts, the dark hairs being more or less pencilled with grey; the flank membranes are generally more distinctly pencilled, and consequently of a paler general hue than the back, and the limbs are black externally. Specimens which are totally white, and others which are white and irregularly variegated with grey or dusky, are not rare.

	Inches.	Lines.
Length of skull	2	4½
Width of ditto	1	5½
" between orbits		4
Length of nasal bones		8¼
Depth of zygomatic arch behind		3½
Length of palate	1	2
" of the six upper, contiguous, molar teeth, taken together		9¼
" of the lower jaw	1	6
Height of ditto in a vertical line dropped from apex of coronoid process		11
Length of five contiguous molar teeth, taken together		9¼

Mr. Gould informs me that the Taguan Flying-Phalanger is chiefly confined to the "scrub" districts of New South Wales.

Petaurus Peronii.

Desmarest describes this animal as having the body brown above, and white beneath; the head brown, particularly around the eyes; the muzzle suffused with yellow; the ears very pointed, brown above, and whitish at their base internally, and this colour is somewhat extended on to the cheeks; chin, deep brown; flank membranes above, brown, variegated with grey; haunch brown, shaded into yellowish; thighs externally, as well as the hind feet, of a deep brown; tail cylindrical, rather

longer than the body, brown, and having about half an inch at the extremity yellowish white; under surface of the neck, inner surface of the limbs and flank membranes, as well as the abdomen, yellowish white. Length of head and body, 8 inches 2 lines; tail, 9½ inches, French measure.

In the Paris Museum I noticed a Flying-Phalanger which agreed so precisely with the above description, both as to size and colouring, that I could scarcely doubt it was the original of Desmarest's description. This specimen, it appeared to me, was a young individual of the *Petaurus taguanoïdes*: it had the ear densely clothed with fur on the outer surface, as in that species, from which it differed only in having the tip of the tail white; a difference which cannot be regarded as important, since other species sometimes have the tail white at the point, although normally of a different colour at that part. The difference which Desmarest notices as existing between his *P. Peronii* and the *P. taguanoïdes*, viz. that the flank membrane in the former extends to the elbow only, whilst in the latter it extends to the wrist, does not exist: I have always found the flank membrane terminate at the elbow in *P. taguanoïdes*: one other difference, it would appear from the description, separates the two species, since the ears of *P. Peronii* are described as "*très-pointues*:" possibly this is a misprint for *très-poilues*.

Subgenus 2. *Belideus*[1].

Petauri with long and nearly naked ears, a bushy tail, the lateral membrane extending to the outer finger; the outer two fingers of the hand long, and equal to each other, or very nearly so; the second and third fingers distinctly shorter than these;

[1] From βέλος, a dart or javelin.

the second, the shortest of the latter two, and the inner, or first finger, very short. The dental formula is, incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; premolars, $\frac{3-3}{4-4}$; true molars, $\frac{4-4}{4-4}$, 40.

There are three well determined species in this section, the *P. australis*, *P. sciureus*, and *P. breviceps*, to which Mr. Gould has added a fourth species, *P. ariel*. They have the anterior incisor teeth of the upper jaw large, somewhat suddenly dilated immediately below the fang, and assuming a triangular form. In *P. australis* they are broader than in either the *P. sciureus* or *P. breviceps*. The next incisor, on either side, is smaller than the posterior one, narrow at the base, and broad at the apex. The third incisor is broad, and has a sharp incurved cutting edge. The canine is tolerably large, separated by a narrow space on either side, from the false molars, or incisors; compressed and pointed, and its anterior and posterior edges are sharp; the exposed part of this tooth is more elongated than that of either of the molars. The first premolar on either side is large, broad, compressed, and pointed, has a slight indication of an anterior and posterior lobe, and two distinct fangs. The second premolar is small, short, and compressed, and has a minute anterior lobe: this tooth is separated by a considerable space from the first premolar, and by a narrow space from the third; the latter touches the first true molar, is narrow in front, and presents one triangular, and pointed cusp. The first true molar is considerably larger than the following molars, each of which is smaller than the preceding, so that the last is not equal in bulk to one-half of the first. With the exception of the last, all the true molars present four somewhat blunt and rounded tubercles, and in general appearance very much resemble the corresponding teeth in the squirrel. The last molar has but three tubercles —two in front, and one behind. The incisors of the lower jaw are long, compressed, and pointed, and have the upper

and lower edge sharp; they are almost horizontal in their direction, being but slightly curved upwards. Next follows, on each side, a series of four small premolars, the hindermost of which has two fangs, whilst the others appear to have but one. The true molars nearly resemble those of the upper jaw, though they are narrower and larger. The first has a large irregular anterior lobe, which is more elevated than any other part of the tooth, and is divided into two tubercles: the three posterior molars have each four tubercles. The space occupied by the true molars is relatively much less in *Belideus* than in *Petaurista*.

PETAURUS (*Belideus*) AUSTRALIS.

The Yellow-bellied Flying-Phalanger.

Petaurus australis. SHAW, Naturalists' Miscellany, Pl. 60. 1791.
Didelphis Petaurus. SHAW, General Zoology, Vol. i. Part 2, p. 496, Pl. 112. 1800.
? ——— *macroura*. SHAW, Zoology of New Holland, No. 3, p. 33, Pl. 12; General Zoology, Vol. i. Part 2, p. 500, Pl. 113.
Petaurus flaviventer. DESM. in Nouv. Dict. d'Hist. Nat. tom. xxv. p. 403. 1818.
Petaurista ——— DESM. Mammalogy, Part 1, p. 269. 1820.
Belideus ——— GOULD, Mammals of Australia, Part 1, Pl. 3.
Hepoona Roo. HUNTER, in White's Journal of a Voyage to New South Wales, p. 288.

Ear very long: fur soft; general colour on the upper parts of the body, greyish, suffused more or less strongly with fulvous; the upper and under surface of the wing membranes, a broad dorsal stripe; the chin, muzzle, and back of the ears, at the base, dusky: legs black, throat and abdomen yellow-white, or bright yellow.

Inhabits New South Wales.

The Yellow-bellied Flying-Phalanger is usually rather

more than a foot in length, without including the tail, which is cylindrical, bushy, and considerably longer than the head and body taken together. The ears are of an elongate ovate form, and but sparingly clothed with hairs; indeed, nearly naked, excepting on the outer side at the base, where they are covered with fur like that on the head. The fur of the animal is long and soft, and subject to some variation in colouring; the ground colour on the upper parts of the body, however, is most frequently greyish, but much suffused with brownish yellow; the sides of the muzzle are dusky,[1] and the eyes are encircled with the same dark hue; the ears are black, and so is the fur of their base externally, but at the posterior angle it is yellowish: a broad blackish mark runs along the back to the root of the tail, and the flank membranes are dusky above and beneath, but edged with a yellowish fringe of hairs. The limbs and feet are black externally, and the former are all black on the inner side in the region of the wrist and ankle. The chin is dusky, and the throat, abdomen, and inner side of the limbs at the base are yellow. The tail is dusky, but suffused with brownish yellow, excepting on the apical third, which is black. The sides of the neck are greyish, and there is usually a pale spot on the cheek behind the eye. Sometimes the upper surface of the head and body are chiefly of a brownish black hue, and the yellowish grey assumes the form of two longitudinal bands, separating, on either side, the broad dark band of the back from the dark colouring of the upper surface of the flank membrane. In other specimens the prevailing hue on the upper parts is fulvous brown, the dorsal black band being narrow, and the bright colour extending somewhat on to the flank membrane: the abdomen of a rich yellow hue.

[1] As I frequently use this term, I may as well explain that by it I mean *a dark hue approaching to black.*

The naked portions of the hand and feet, in the living animal, are of a yellowish flesh colour, and the naked tip to the nose is of a pale pink hue. In the third column I have given the dimensions of a specimen taken immediately after death. It lived for some time in the Gardens of the Zoological Society. The dimensions in the other two columns are taken from stuffed specimens:—

	Ins. Lns.	Ins. Lns.	Ins. Lns.
Length from tip of nose to root of tail	14 0	14 0	12 0
" of tail	19 0	18 0	15 6[1]
" of ear	1 9	1 9	1 11
" of fore foot, including the nails	1 6	1 7	1 6½
" of hind foot and nails ...	1 7½	1 7½	1 8

Mr. Gould furnishes us with the following interesting account of the habits of the present species. "The Yellow-bellied, or Long-tailed Flying-Phalanger," this gentleman observes, "is common in all the brushes of New South Wales, particularly those which stretch along the coast from Port Philip to Moreton Bay. In these vast forests, trees of one kind or another are perpetually flowering, and thus offer a never failing supply of blossoms, upon which the Yellow-bellied Flying-Phalanger feeds: the flowers of the various kinds of gums, some of which are of great magnitude, are the principal favourites. Like the rest of the genus, it is nocturnal in its habits, dwelling in holes of trees and in the hollows of the larger branches during the day, and displaying the greatest activity at night, while running over the small leafy branches, frequently even to their very extremities, in search of insects, and the honey of the newly-opened blossoms. Its structure being ill adapted for terrestrial habits, it seldom descends to the ground, except for the purpose of

[1] Without including the fur.

passing to a tree too distant to be attained by springing from the one it wishes to leave. The tops of the trees are traversed by this animal with as much ease as the most level ground is by such as are destined for terra firma. If chased, or forced to flight, it ascends to the highest branch, and performs the most enormous leaps, sweeping from tree to tree with wonderful address: a slight elevation gives its body an impetus, which, with the expansion of its membrane, enables it to pass to a considerable distance, always ascending a little at the extremity of the leap; by this ascent the animal is prevented from receiving the shock which it would otherwise sustain."

Petaurus macrourus.

The *Didelphis macroura* is described by Shaw as about equal in size to the Black Rat (*Mus rattus*), of a dark brown-grey colour above, and whitish beneath; the head and neck also whitish, but a dusky stripe runs along the top of the head almost to the nose; the ears whitish, moderately large, and slightly rounded; the upper parts of the fore feet whitish; and the lower half of the tail of a deeper black than the beginning. The above description was drawn up by Dr. Shaw, upon a specimen sent over by Mr. White. I strongly suspect it is the young of the animal described by the same author, also from White's collection, under the name of *Petaurus australis*.

down, approached, it made a spring from aloft to avoid him. At this moment the ship gave a heavy lurch, which, if the original direction of the little creature's course had been continued, must have plunged it into the sea. All who witnessed the scene were in pain for its safety; but it suddenly appeared to check itself, and so to modify its career that it alighted safely on the deck.

Our little animal is figured and described in Phillip's Voyage to Botany Bay, under the name of Norfolk Island Flying-Squirrel, but whether the animal is really found in that island, so remote from the coast of Australia, the author does not inform us. Possibly it may have been introduced there by the shipping.

PETAURUS (*Belideus*) BREVICEPS.

Short-headed Flying-Phalanger.

Petaurus (*Belideus*) *breviceps*. WATERHOUSE, Proceedings of the Zoological Society for Nov. 1838, Part 6, p. 152; Marsupialia (Vol. xi. in Naturalists' Library), p. 290, Pl. 29.

Tail long and cylindrical: general colour of the upper parts of the body ashy grey; a black stripe commencing near the tip of the muzzle, runs along the back; ears black externally at the base, and white at the posterior angles; flank membrane blackish above, but edged with white; under parts of head and body, white: tail black at the tip.

Inhabits New South Wales.

In colouring this animal greatly resembles the ***Petaurus sciureus***; it is, however, of a smaller size, and always has a long cylindrical tail: the size and proportions of its skull also differ. The head is short, the ears moderate, almost naked, being very sparingly furnished with dusky hairs, excepting at the base externally, where they are covered with fur

like that of the head, and of a dusky or blackish hue; at the hinder angle, however, the fur is white. The tail rather exceeds the head and body in length, is cylindrical, and but moderately bushy. The fur is very soft, and its general tint on the upper parts of the body is ashy grey: a dusky longitudinal line extends from between the eyes along the back; on the back it is rather indistinct, and towards the hinder part it is obliterated. The hairs of the tail are nearly of an uniform ashy grey hue, but somewhat inclining to dusky; on rather more than two inches of the apical portion the hairs are black. The flank membrane is blackish above, but white at the edge; the white fringe which margins this membrane is continued along the hinder part of the arm, and terminates at the tip of the little finger. The upper surface of the fore foot is smoky black; the hind foot is of a deep grey colour above, inclining to black: a dusky mark is observable along the outer side of the hind legs, and the external margin of the hind foot is fringed with long hairs. The under parts of the head and body, as well as the inner side of the limbs, are white, or nearly so.

	Lines.	Inches.
Length from tip of nose to root of tail	6	6
" of tail	7	0
" of hind foot, not including the nails ..	1	1
" of ear		9
" of skull	1	3½
Width of ditto	1	0
Length of nasal bones		5¾
" of frontal bones		6¼
" of palate		8

The short-headed Flying-Phalanger must be very local, since it has been rarely sent home amongst the skins of mammals from Australia; I once, however, had an opportunity of examining an immense number of skins of this animal, which had been prepared for the furrier: they were

readily distinguished from the few specimens of *P. sciureus*, with which they were mixed, by their smaller size, and the comparatively slender and cylindrical tail. In some few specimens the extreme point of the tail was white.

Petaurus (Belideus) ariel.

Belidea ariel. Gould, Proceedings of the Zoological Society for January, 1842, Part 10, p. 11.

General colour of upper parts of head and body ashy grey; a black stripe, commencing on the muzzle, extends back nearly to the root of the tail; ear with a blackish patch at the base externally; flank membrane dusky above; the edge, as well as the whole of the under parts of the body, pale yellow: tail black at the apex.

Inhabits North Australia; Port Essington.

In size and proportions this species so closely resembles the *Petaurus breviceps*, that I do not think we are justified in regarding it as distinct, on account of the slight differences which its colouring presents, when compared with the animal just mentioned. The differences alluded to consist in the upper parts of the body being rather paler, and the under parts of a delicate yellow. The tail is cylindrical, as in *P. breviceps*. The fore and hind feet are of a pale yellowish tint: a narrow black mark, commencing between the eyes, runs along the back, and extends nearly to the root of the tail: the eyes are narrowly encircled with black, and a black ring surrounds the ear at the base, but is interrupted at the posterior angle, where the hairs are pale yellow. The upper surface of the head is rather paler than the back, which is of a pale ash colour, but indistinctly suffused with yellowish: the upper surface of the flank membrane is blackish, especially

near the margin—this latter is pale yellow: the anterior part of the fore-arm and region of the wrist, as well as the posterior part of the hind leg, are dusky.

	Inches.	Lines.
Length from tip of nose to root of tail	6	0
" of tail	7	0
" of ear		8
" from tip of nose to ear	1	3½

Dr. Müller, in his list of the New Guinea Mammalia, includes the *Petaurus sciureus.* That author has not yet described the animal alluded to, and I cannot help thinking it is more probably the present species, since this is found on the north coast of Australia, where, I believe, the *P. sciureus* does not occur.

Subgenus 3. *Acrobata.*

Acrobata. DESMAREST, Mammalogie, Pt. 1, p. 270. 1820.

Tail moderately long, clothed above and beneath with short adpressed hairs, and fringed on either side with longer hairs: ears moderate, well clothed externally with fine hairs: feet with small claws; thumb of hind foot large; flank membrane scarcely extending to the wrist. Dental formula:—incisors, $\frac{6}{2}$; canines, $\frac{1-1}{0-0}$; premolars, $\frac{3-3}{4-4}$; true molars, $\frac{3-3}{3-3}$ = 36.

The anterior upper pair of incisor teeth in *Acrobata* are considerably larger than the other two pairs, and are much expanded at the extremity; the posterior two incisors, on either side, are small, and the second is the smallest: the canine is a well developed tooth, and is placed close to the incisors, and distinctly springs from the superior maxillary bone: this tooth is followed, on either side, by three well

developed premolars, which are compressed and pointed, and present nearly a triangular outline when viewed on the outer or inner side, but each of these teeth has a very small anterior and posterior cusp at the base; they are all two-rooted, and the middle tooth is a trifle larger than the others, which are about equal in size; the hindermost premolar is in contact with the true molars, the remaining two are separated from each other, or from the canine, or the last premolar, by narrow interspaces: the three true molars are small, and successively decrease in size from the first to the last; the two foremost have two outer, pointed cusps, and two smaller inner cusps; the last molar has but three cusps. The two incisors of the lower jaw are very long, pointed, and nearly horizontal, and are followed on either side by two small, simple premolars; then two other well developed premolars, having the crown much elevated and pointed (the foremost most so), and a small posterior cusp; they are two-rooted. The three true molars have each four cusps; the outer anterior cusp of the first of these teeth is most elevated. All these teeth of the lower jaw form an uninterrupted series.

This dentition, it will be perceived, agrees very closely with that found in *Dromicia*, the chief difference consisting in the greater development of the premolars in *Acrobata*. In both cases there is an approach to the insectivorous type of dentition (most marked in *Acrobata*), as evinced in the small size of the true molars, when compared with those of the large Phalangers, and the greater importance which the premolars assume: the peculiar triangular form, and the presence of two roots, in many of these teeth, remind us strongly of the premolars in the small insectivorous Marsupials, such as the Phascogales[1].

[1] I cannot help here calling attention to certain points which I have endeavoured to illustrate elsewhere, viz. that the affinities of species of one group to species of another, are more near, or more remote, according to the rank of

PETAURUS (*Acrobata*) PYGMÆUS.

Pigmy Flying-Opossum.

Didelphis pygmæa.	SHAW, Zoology of New Holland, No. 1, Pl. 2, p. 5, 1794.—General Zoology, vol. i. Pt. 2, p. 501.
Petaurus pygmæus.	DESMAREST, Nouv. Dict. d'Hist. Nat. tom. xxv. p. 405. 1818.
Petaurista (Acrobata) pygmæa.	DESM. Mammalogie, Pt. 1, p. 270. 1820.
Petaurus (Acrobata) pygmæus.	WATERHOUSE, Marsupialia, p. 293, Pl. 30.

Fur rather short and soft; on the upper parts of the body of an ashy grey brown colour, and on the under parts, white, or yellowish white: ear with a dusky patch in front externally, and whitish behind: tail ashy brown, paler below than above: eye encircled with black.

Inhabits New South Wales.

This pretty little animal, which is the "Opossum Mouse" of the colonists of New South Wales, is said to be exceedingly numerous in the vicinity of Port Jackson. It is about the size of the Common Mouse, and of an ashy brown colour, inclining to grey, on the upper parts of the body, flank mem-

the groups exhibiting those affinities. In the present case we have an instance, on the one hand, of two species of *Phalangistidæ* of different genera, approximating very closely; and, on the other hand, of a species of the family *Phalangistidæ* approaching to certain *Dasyuridæ*. Now, the approximation of the species of the two genera of the same family, is much closer than that evinced by the Acrobata to the Phascogale (these being of different families), inasmuch as the resemblance in the latter case is only in the dentition, and that but partial, since the structure of the molar and incisor teeth in Acrobata is in accordance with the Phalangista type, and unlike that of the Phascogales; and, in the conformation of the extremities, I can perceive no tendency on the part of *Acrobata* to assume the characteristics of the *Dasyuridæ*; the second and third toes of the hind foot are not less perfectly united in *Acrobata* than in other *Phalangistidæ*.

brane, and outer side of the limbs; and yellowish white on the under parts. The feet are rather paler than the legs externally: the lower part of the cheeks and the upper lip are yellowish white; the eye is encircled with blackish, and this dark hue is considerably extended in front of the eye. The ears are of moderate size, rounded, moderately well clothed with fur externally, where they are dusky towards the fore part, and whitish behind; on the inner side of the ear near the apex, and from the apical portion, spring numerous long and extremely fine hairs. The hairs of the moustaches are numerous, slender, and of a dusky brown colour. The tail is about equal to the body in length, tolerably well clothed with hairs both above and beneath, but the short hairs on these parts lie close to the skin; on the sides the tail is fringed with longer hairs, and, including the hairs, its horizontal diameter is about a quarter of an inch; the upper parts of the tail are of the same ashy brown hue as the body, and the colour of the under surface differs only in being paler. The fur of the animal is rather short, and very soft; on the back it is grey next the skin; on the throat and chest each hair is uniform yellowish white throughout its length, but on the abdomen the hairs are for the most part grey at the root.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to ear	3	7	3	6
" of tail	2	9	2	10
" of ear		3½		3½
" of fore foot		4½		
" of hind foot		5		

The dimensions in the first column are taken from a specimen in the British Museum, and those in the second give the size of a specimen in the museum of the Zoological Society.

The following are the admeasurements of a skull of *Acrobata pygmæa* in the British Museum :—

	Inches.	Lines.
Length of skull		9¾
Width of ditto		6½
Total length of palate		5
From front of foremost incisor to back of last molar		4⅓
Length of nasal bones		3½
Width of interorbital space		2½
Length of lower jaw		5¾
Height of ditto in a vertical line dropped from the apex of the coronoid process		2¼

The bones of the skull of ***Petaurus pygmæus***, like those of the little Phalangers forming the section *Dromicia*, are extremely thin and semi-transparent; the cerebral portion of the cranium is large in proportion to the facial part; the occipital opening is very large, and the zygomatic arches are slender: the angular portion of the lower jaw is in the form of a slender pointed process, directed inwards and backwards so as to form an obtuse angle with the plane of the horizontal ramus: the coronoid process is also slender.

As compared with the skull of a species of *Dromicia* now before me (the *D. Neillii*), that of *P. pygmæus* differs in certain points which are worthy of notice. In the Dromicia the posterior root of the zygoma is much expanded, or, as it were, inflated, to increase the air-cells of the auditory chamber, whilst in the Acrobata there is no such expansion of the zygomatic process of the temporal bone. The auditory bulla is much more prominent in the Dromicia than in the small Flying-Phalanger, and is almost entirely formed by an expansion of the petrous element of the temporal bone; in ***Petaurus pygmæus*** the auditory bulla is formed partly by the same portion of the temporal bone, but chiefly by the great ala of the sphenoid.

Genus, *Tarsipes.*

Tarsipes. Gervais and Verreaux, Proceedings of the Zoological Society for January, 1842, Pt. 10, p. 1.

Teeth.—Incisors, $\frac{2-2}{2}$; canines, $\frac{1-1}{0-0}$; molars, $\frac{3-3}{3-3}$ (or more). All the teeth of the upper jaw minute and simple, and separated from each other; those of the lower jaw are also separated, and minute, if we except the two incisors, which are well developed, long, slender, and pointed, have the upper and lower edges sharp, and are horizontal in their direction.

Head.—With the muzzle elongated and slender; the muffle naked: mouth opening small: tongue long, slender, and sharply pointed.

Limbs.—Fore and hind legs nearly of equal length, the latter the longer: fore feet with five smallish toes, each somewhat thickened at the extremity, and with a minute scale-like nail impressed, as it were, into the flesh, on the upper surface of the toe; but this nail far from reaches either the side, or the extremity of the toe. Hind feet also with five toes, of which the innermost assumes the form and functions of a thumb, is slender, rather long, and nailless; the second and third toes very short, joined to the extremity, and furnished with small pointed nails, which are directed upwards almost at right angles to the plane of the toe: fourth toe twice as long as the second and third, joined, toes; and furnished, like the fifth, which is considerably shorter than the fourth, with a scale-like nail on the upper surface.

Tail long, slender, rather sparingly clothed with small stiff hairs, and having the skin scaly: a small space at the apex beneath is naked.

Skull with the bones very thin and semi-transparent: lower jaw consisting of two slender rami, without any distinct coronoid, or angular portions, and with an oblong perforation behind.

Stomach small and simple; the walls very thin and transparent at the cardiac extremity; the œsophagus terminating about

midway between the extremities; the cardiac end nearly spherical: the mesial portion much contracted; and, from that part to the pylorus, the stomach becomes gradually narrower. Intestines exceeding the entire length of the animal by about one half, simple, slender, and destitute of cœcum[1].

Female with a distinct pouch: mammæ four in number.

It will be seen that the dental formula above given does not agree precisely with that given by Messrs. Gervais and Verreaux, and the difference, there are good reasons for believing, arises from a want of constancy in the number of the very minute teeth with which the jaws of our little animal are furnished. In a carefully preserved skull before me, I do not even find the same number on opposite sides of the jaw, there being three molars on one side of the upper jaw, and four on the other. The canines, which are rather more developed, and the lower incisors, are probably the only teeth which will be found constant in all individuals.

In two skulls of Tarsipes, I find four minute transparent incisors situated on the fore part of the intermaxillary bones; these are distinctly separated from each other, and, between

[1] The specimen dissected by me was a female, and not in the best of conditions for examination. I feel pretty certain, however, that the points above noticed will prove to be correct. I found the small intestines of a little Phalanger (the *Dromicia Neillii*), although the animal was of smaller size than the Tarsipes, not only proportionately longer, but having a greater diameter. The stomach was simple, had the longitudinal diameter about one-fourth greater than the vertical, the cardiac end large and spherical, the depth of the opposite end about one-third less than that of the cardiac, and the œsophagus entering near the middle. The cœcum was 8½ lines in length; the small intestines about 5 inches, and the large about 1¼ inches in length; the length of the animal being 2¼ inches, from the tip of the nose to the root of the tail. The cœcum is therefore smaller in proportion in this little Phalanger than in the larger species of the group, and such is found to be the case in the small Petauri, in which the dentition approaches to that of the insectivorous Phascogales, where the cœcum is absent—in some at least, I may say, according to my own observations.

the hindermost on either side, and the canine, there is a considerable hiatus, and between the canine and the little molars there is a long vacant space. The number of molar teeth in each of these two skulls is, specimen No. 1, $\frac{3-4}{3-3}$; specimen No. 2, $\frac{3-}{2-3}$*. The molars of the upper jaw are rather widely separated from each other ; those of the lower jaw are separated only by narrow spaces, and are placed about midway between the extremities of the ramus.

In the structure of the feet Tarsipes agrees *essentially* with the Phalangistidæ, and is approached most nearly by the small species of that group forming the section *Dromicia*, in which the ends of the fingers and toes are expanded, and the nails small. Amongst the skeletons of Marsupial animals which I have had an opportunity of examining, I also find the general structure of that of Tarsipes most assimilated to the *Phalangistidæ*. It is indeed very similar to the skeleton of *Petaurus sciureus* in most respects (I will point out the differences hereafter), and I anticipate that we shall find a nearer approximation in the skeleton of the Dromicias. In the elongated muzzle and concave palate of Tarsipes, we perceive modifications of these parts suited to lodge the long and slender tongue, which, it appears, is thus formed for the purpose of collecting honey—a food requiring no mastication—and hence the rudimental condition of the teeth. The long and sharp, horizontal, lower incisors, we may readily suppose, would assist in the operation of piercing, and opening a passage for the tongue, into those parts of the flowers in which the honey is lodged.

But one species of the genus *Tarsipes* is known, and that inhabits the west coast of Australia.

* Part of the left side of the jaw is wanting in this specimen.

TARSIPES ROSTRATUS.

Long-snouted Tarsipes.

(Plate 11, Fig 1.)

Tarsipes rostratus. GERVAIS and VERREAUX, Proceedings of the Zoological Society for January, 1842, Pt. 10, p. 1; Guérin's Magasin de Zoologie, année 1842, Mammifères, Pls. 35—37.

" " GOULD, Mammals of Australia, Pt. 1, Pl. 1.

" *Spenseræ.* GRAY, in Annals and Mag. of Nat. Hist. for March, 1842, vol. 9, p. 40.

Fur short, adpressed, and rather harsh ; general tint grey, more or less suffused with rust colour ; sides of body distinctly tinted with rust colour, or rusty yellow ; under parts rusty yellow, or rusty white ; back with three longitudinal dark lines : tail dusky above, greyish beneath.

Inhabits Western Australia.

The Tarsipes, so named on account of its feet having a considerable resemblance to those of a little animal found in the Indian Islands, and called the Tarsier, is certainly one of the most interesting of Mammalian forms recently discovered. Let the reader imagine a little quadruped of the size and general form of a mouse, but with a long, slender, and pointed muzzle, and to this we will add, that its fur is shorter and coarser, and more closely applied to the skin, than in the mouse ; that its colouring is richer, and that it has three dark longitudinal stripes on the back, of which the two outermost are rather indistinct. Such is the *general* aspect of the Tarsipes ; but our animal requires to be more closely examined, and in so doing we shall find that its characters essentially differ much from those of the mouse, that they indicate a lower grade of organization, and a difference of habits, and

food. The female Tarsipes possesses a distinct pouch, and the male presents the corresponding characteristics of the Marsupial Mammalia: in structure, the feet are adapted for climbing, and are more suited for grasping small twigs than for ascending large trees, since the toes are provided only with very small nails, which are for the most part embedded in the upper surface of the expanded fleshy pad with which each toe is terminated. The long and slender, opposable thumb of the hind foot is nailless, the second and third toes are united to the extremity, but the two nails of these toes are distinct, pointed, and hollow beneath, and are the only nails which have the points free: they are no doubt used (as I have observed in some other Marsupials) for cleansing the fur. The head is long, and the muzzle is very long, slender, and pointed; the ears rather small, rounded, and clothed with very small hairs. The eyes are small, of a black colour, and very prominent. The limbs are of nearly equal length, but the hinder legs are slightly longer than the anterior. The tail is longer than the head and body taken together, and clothed with small stiff hairs, like the tail of a mouse, and these do not completely hide the scaly skin. The colouring of the fur varies somewhat in different individuals, but may be described as generally grey, more or less suffused with rust colour on the upper parts of the body, and yellow on the under: a narrow black line, commencing at the back of the head, is continued along the back to the root of the tail, and on each side of this is a broadish grey space, followed by a rusty brown longitudinal band, usually not well defined, and blending externally into the rich rust colouring which is almost always observed on the sides of the body. The upper surface of the head is brown along the mesial portion; the sides of the face are tinted with rust colour: the hairs of the moustaches are numerous, moderately long, and black. The small hairs with which the ears are clothed are by no means

abundant; on the inner surface of the ear they are yellowish, those on the outer side are darker, especially near the front margin, where they assume a dusky hue. There is a small lobe near the posterior angle of the ear internally. The feet are clothed above with small glistening pale hairs. The tail is dusky above, and greyish beneath. The hairs on the back are of a deep lead-grey colour next the skin, and those on the abdomen are of a paler grey at the root.

In some specimens the sides of the body are yellowish, and the under parts are nearly white. The male specimens are generally smaller than the females.

	Male.		Female.		Female.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail[1] ...	3	4	3	9	3	0
" of tail	3	6	4	0	3	7
" from nose to ear	1	0	1	2		11½
" from nose to eye		6		7¾		6
" of ear		4		4		4¼
" of fore foot		3¾		3¾		4
" of hind foot		7¼		7⅓		7½
" of thumb of ditto		2¼				2¼
" of the second and third, joined, toes		1⅙				1⅛
" of the fourth toe		3				3
" of the outer toe		2				2
" of middle finger of hand		1⅔				1¼

Mr. Neill having kindly sent me a female specimen preserved in spirit, I will avail myself of the opportunity to notice the leading points which the entire skeleton of this interesting animal presents, since only some few parts (the

[1] The dimensions in the two first columns are taken from skins, and those in the third column from a specimen preserved in spirit. All of these specimens are from King George's Sound.

skull, tibia and fibula, and the radius) have hitherto been noticed.

The skull is proportionately large, being about equal to half the body in length, and is remarkable for the thinness and semi-transparency of the bones of which it is composed, the long and tapering facial portion, and the short and slender zygomatic arch, and consequently the small size of the fossa, of which it forms the outer boundary. Viewing the under surface of the skull, the great extent of the auditory chamber, and the imperfect condition of the palate, are also striking.

The cranial portion of the skull occupies rather more than one third of the entire length, approaches to a spherical form, and presents a smooth surface. On the occiput scarcely any trace of a crest is perceptible, and the sutures which, in most Marsupials, mark the boundaries of the separate bones of which it is composed, are here obliterated, but all the other sutures of the cranium are distinct : the occipital opening is large. The interparietal bone is very large, and transverse ; the parietal bones are also large, whilst the frontal bones are rather small, and considerably contracted between the orbits. The lachrymal bones are tolerably large, and present the usual perforation. The zygomatic arch is extremely slender, and short, being in length equal to one-fifth of that of the skull; it is composed almost entirely of the malar bone, which sends up a small post-orbital process. The glenoid cavity is very small. The nasal bones are long, narrow in front, and much expanded behind. The large ear chamber presents an anterior and a posterior convex swelling, of which the foremost is the larger, and is formed partly by the sphenoid ala, and partly by the squamous portion of the temporal bone ; the hinder bulb, which is more convex, is due to the petrous and mastoid elements of the temporal bone. I cannot trace the tympanic bone. The palate is strongly concave in the transverse direction ; presents two long and narrow incisive openings, and two posterior openings, which are also narrow. The channel on the back part

of the skull, which is bounded on either side by the auditory bullæ, is continued forwards and joins the post-palatine openings: the anterior half of this channel, which is much contracted, is bounded by two long and thin plates of bone, which appertain chiefly to the anterior sphenoid; and from about the middle of these plates, a thin process appears to have been thrown across the valley, but it is partly broken in the skull before me; this process no doubt formed the posterior boundary of the palate, and is a portion of the palatine bone; in front of it, a longitudinal ridge forms the separation of the two post-palatine openings. The anterior root of the zygoma is perfectly hollow, and a small perforation leads into it from the under side. The lower jaw is composed of two very slender, and almost straight rami, and presents neither angular portion nor coronoid process: they converge and meet in front, but are by no means firmly attached to that part, and they terminate posteriorly in a small semicircular condyle: the hinder third of the ramus is divided by a long narrow perforation into an upper and a lower thin branch: these branches meet behind at a short distance from the condyle, and at the point where they join in front we can perceive a faint trace of the coronoid process, indicated by the ramus of the jaw being slightly expanded in the vertical direction at that part.

Of cervical vertebræ, I find the usual number: the atlas vertebra has the lower boundary of the ring formed by a thin cartilage, in the middle of which a minute transverse ossicle represents the body of the vertebra. The vertebra dentata has a moderately developed spine. The third, fourth, fifth, and sixth cervical vertebræ are totally destitute of spinous process; the seventh has a small spine. The dorsal vertebræ are thirteen in number, and are provided with slender, and but moderately elevated spinous processes; these processes, from the first to the eighth, are directed obliquely backwards; the remaining processes of the dorsal vertebræ, as well as those of the lumbar and sacral vertebræ, are upright. The ribs are compressed, and slender. The sternum is composed of six long and slender bones. There are five lumbar vertebræ, each of which has a moderately developed transverse, and a short

spinous, process. Of sacral vertebræ there are three; their transverse processes join the ilium. The caudal vertebræ are very numerous, being thirty-four in number [the total number of vertebræ, therefore, is sixty-two]; they present little worthy of notice, if we except that the transverse processes of the basal three are much developed, flat, and expanded: the fourth caudal has but a very small transverse process, and the remaining vertebræ are simple, or nearly so: between the interspace of each pair, beneath, is a small bone having the outer surface flattened—it represents the hæmapophysis of the vertebra. The spine of the scapula is straight, or very nearly so, inclines over the infra-spinal part of the scapula, and is produced in front into a long, and extremely slender (almost hair-like) acromion process. The upper and lower edges of the scapula run nearly parallel at the anterior third portion, and there form a narrow neck; the lower edge is very nearly straight, and, passing backwards, gradually recedes from the spine, and the narrow infra-spinal fossa is truncated behind, so that its outline at that part forms a right angle with the line of the spine: the supra-spinal portion of the scapula is much larger, and, from the neck, is expanded so as to form nearly a semicircle. The clavicle is long and slender. The humerus is slender, has no perforation at the lower extremity: the deltoid ridge forms an obtuse angle, at the termination of the anterior third; the external and internal tubercles are small; the former rises scarcely as high as the head of the humerus; the outer condyloid ridge terminates in an obtuse angle at the commencement of the lower fourth of the humerus. The remaining bones of the fore leg present nothing to arrest our attention: the ulna and radius are in contact nearly for their entire length, being but slightly separated in the middle; the olecranon is well developed. The pelvis offers no peculiarities, excepting that it is more elongated than usual. The marsupial bones are straight, small, and slender. The femur is straight, has the head directed inwards and forwards, and joined to the shaft by a short neck; a depression for the ligamentum teres is visible; the two trochanters are small. The patella is present. The tibia and fibula are distinct, in contact at the

lower extremity, but, commencing about the middle, they rather suddenly diverge, owing to the bending forwards of the shaft of the tibia, which, I may observe, is considerably compressed: at the proximal extremity, the fibula (which is unusually slender below) is suddenly expanded and flattened, sending out a square process posteriorly, and a smaller process in front to join the head of the tibia. With respect to the structure of the feet, it will be sufficient to remark, that they resemble those of the species of *Phalangista* in all essential points.

I have before said that the skeleton of Tarsipes bears a very great resemblance to that of *Petaurus sciureus*. In both animals nearly all the cervical vertebræ are destitute of spinous processes[1]: the scapula is very nearly the same in both, but the lower posterior angle is more produced in *P. sciureus*, and the acromion process is expanded. The principal differences are, that in Tarsipes the bones of the limbs are proportionately shorter than in the *Petaurus*; the lumbar vertebræ, as well as the bones of the pelvis, are likewise shorter: the humerus differs in not being perforated at the lower extremity, and in having the outer condyloid ridge less developed; the trochanters of the femur are smaller, and the lesser trochanter is placed nearer to the head of the femur; the tibia is more arched, and more compressed at its upper half, and the fibula is rather more expanded at its proximal extremity. In the general form of the skull *Tarsipes* is approached most nearly by the small species of *Perameles*.

"The Tarsipes is generally found in all situations suited to its existence, from Swan River to King George's Sound, but from its rarity, and the difficulty with which it is procured, notwithstanding the high rewards offered, the natives only

[1] The spinous processes of the cervical vertebræ are small in the Phalangers generally, and very small in the *Petaurus australis*, but I have seen no marsupial skeleton in which they are wanting excepting in *Petaurus sciureus* and Tarsipes. Probably in the minute species belonging to the sections *Acrobata* and *Dromicia* the same structure will be found.

brought me four specimens; one of these, a female, I kept alive for several months, and it became so tame as to allow itself to be caressed in the hand without evincing any fear, or making any attempt to escape. It is strictly nocturnal, sleeping during the greater part of the day, and becoming exceedingly active at night: when intent upon catching flies, it would sit quietly in one corner of its cage, eagerly watching their movements, as, attracted by the sugar, they flew around; and when a fly was fairly within its reach, it bounded as quick as lightning, and seized it with unerring aim, then retired to the bottom of the cage, and devoured it at leisure, sitting tolerably erect and holding the fly between its fore-paws, and always rejecting the head, wings, and legs. The artificial food given it was sopped bread, made very sweet with sugar, into which it inserted its long tongue, precisely in the way in which the Honeyeaters among birds do theirs into the flower-cups for honey; every morning the sop was completely honey-combed, as it were, from the moisture having been drained from it by the repeated insertion of the tongue: a little moistened sugar on the end of the finger would attract it from one part of the cage to the other; and by this means an opportunity may be readily obtained for observing the beautiful prehensile structure of the tongue, which I have frequently seen protruded for nearly an inch beyond the nose; the edges of the tongue near the tip are slightly serrated. The tail is prehensile, and is used when the animal is climbing, precisely like that of the *Hepoona* (*Phalangista*). The eyes, although small, are exceedingly prominent, and placed very near to each other; the ears are generally quite erect. When sleeping, the animal rests upon the lower part of the back, with its long nose bent down between its fore feet, and its tail brought over all, and turned down the back. Mr. Johnson Drummond shot a pair in the act of sucking the honey from the blossoms of the *Melaleuca*; he watched them

closely, and distinctly saw them insert their long tongues *into the flower precisely after the manner of the birds above mentioned*[1]."

Mr. Neill, whose notes I have before quoted[2], informs me that the Tarsipes is known to the natives of King George's Sound by the names of "Tait," and "Noolbenger;" that it is very common in the district mentioned, and makes its nest in the overhanging leaves of the *Xanthorrhœæ*, and Kingias. In repeated dissections of these little animals, immediately after their capture, Mr. Neill only found in the stomach a transparent fluid, like honey; and this gentleman is on this account inclined to put faith in the statements of the natives, who inform him that the "Tait" lives upon honey, which it procures by thrusting its long and slender tongue into the cups of the flowers. As nearly all the flowering plants in Australia, Mr. Neill observes, produce honey, it is probable these animals can obtain this food throughout the year.

The specimen of Tarsipes described by Mr. Gray, was, like all other specimens which have come under my notice, from King George's Sound; and, according to the notes quoted by Mr. Gray, the animal is said to inhabit the low scrubby and heathy looking bushes of that district. The notes in question were forwarded to Mr. Gray, together with the Tarsipes and several other interesting animals, by the Governor of South Australia, Capt. George Grey.

Before passing on to the next family, I must not omit to notice that parts of a skull of a species of *Phalangista*, agreeing pretty nearly with *Phalangista vulpina*, were discovered by Prof. Owen amongst the Mammalian remains found by Sir Thomas Mitchell in caverns of Wellington Valley, which have already been alluded to.

[1] From Gould's Mammals of Australia. [2] See page 316.

PERAMELIDÆ, or PERAMELES FAMILY.

Peramelidæ. WATERHOUSE, in Naturalists' Library—Marsupialia. 1841.
Peramelina. GRAY, Annals of Philosophy, xxvi. 1825.

Dentition :—Incisors, $\frac{10}{6}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{3-3}{3-3}$; true molars, $\frac{4-4}{4-4}$ = 48. The teeth rooted; premolars compressed and pointed; true molars tubercular.

Head elongated, the facial part narrow, and pointed; muffle naked; nostrils lateral, and with a longitudinal groove between them; upper lip slightly cleft; ears moderate or very large, provided with two prominent fleshy lobes running backwards from the anterior angle, and a third lobe, also on the inner side, situated near the lower posterior angle.

Limbs unequal—the posterior legs being considerably longer than the anterior. Fore feet with the outer toes rudimentary. Hind feet with the inner toe rudimentary or absent; the second and third toes joined to the extremity, and having small nails; the fourth toe very large, and the outer toe moderate—sometimes rudimentary.

Tail usually short, and clothed with small hairs; sometimes long, and clothed, in parts at least, with very long hairs.

Pouch of the female with its entrance usually directed towards the tail.

Mammæ eight?[1]

Stomach simple. Cœcum of moderate size.

The animals of the present family are of small size, the largest known species being scarcely equal in bulk to the Common Hare. They occur in Van Diemen's Land, and, on the continent of Australia, they have been found in all the

[1] Prof. Owen found eight nipples in the *Perameles nasuta*, arranged in two slightly curved longitudinal rows: possibly this number may not be constant in all the species of *Peramelidæ*.

principal parts which have been visited, up to the north coast. One species (the *Perameles Doreyanus*) has been discovered in New Guinea.

In the structure of the hind feet, the *Peramelidæ* greatly resemble the Kangaroos, as will be seen upon comparing fig. 5 (right-hand figure) with fig. 6 (lower figure) of Plate 12. The Perameles' foot (fig. 5) here represented, however, is proportionately shorter, and the fourth, or principal toe, is less developed than in the Kangaroo's foot; such a distinction is general in the two groups: the *Peramelidæ*, indeed, have the fore and hind limbs less unequal than the Kangaroos, and I strongly suspect they do not progress by leaps like the species of the section last mentioned. Another difference observable in the two feet represented on the plate, consists in the presence of a small inner toe to the foot of the Perameles; but this, I must observe, is not a constant difference, the toe in question being absent in some of the *Peramelidæ*, as, for instance, in the *Perameles lagotis*, where the tarsus is proportionately longer than in most others of the group. We shall have to notice a singular modification of the feet in another species of the present family—the *Chæropus*. The fore feet differ from those of the Kangaroos in having the outer toes rudimentary. In the structure of the skull and teeth there exists much difference in the species of the two sections. The *Peramelidæ* may be readily distinguished from all other Marsupials by the number of their incisor teeth, of which there are ten in the upper, and six in the lower jaw. In no other Australian mammal are there more than eight incisors in the upper jaw: ten of these teeth are found in the Marsupials of America (the true Opossums), but those animals have eight incisors in the lower jaw. The true molar teeth in the animals under consideration are adapted to insect diet, and such we know to be the food of these animals, though, according to the accounts of good observers residing in

Australia, they will likewise eat vegetable substances[1], and we may add that a specimen of the *Perameles lagotis*, which lived in the menagerie of the Zoological Society, even refused meal-worms when offered, and was fed upon bread and milk, almonds, &c.[2]

Fossil remains appertaining to this family have been found by Sir Thomas Mitchell in the caverns of Wellington Valley.

Genus, *Perameles*[3].

Perameles. GEOFFROY, Mémoire sur un nouveau genre de Mammifères à bourse, nommé Péramèles—Annales du Muséum, tom. iv. p. 56. 1804.

Isoodon. DESMAREST, in Nouv. Dict. d'Hist. Nat. tom. xvi, p. 409. 1817.

Peramelidæ with five toes to the foot, of which the two outermost are rudimentary, and nailless, the remaining three well developed, and furnished with large, strong, and solid nails, covering ungual phalanges, which are cleft above, in the longitudinal direction, almost to the root: hind feet with five toes, of which the innermost is rudimentary, and nailless, and sometimes entirely hidden beneath the skin; the second and third toes extremely slender, and joined to the extremity, but with two distinct hollow nails; fourth toe very large, and provided like the fifth (which is well developed) with a solid nail, sheathed upon an ungual phalanx, which is divided like those of the principal toes of the fore foot.

[1] Some of the species of Perameles are said to feed upon the bulbous roots of plants imported into the colonies. It would be well to ascertain whether they do not destroy these bulbs to obtain insects which may have attacked them.

[2] It must be observed that the molar teeth in this animal are less tubercular than in others of its family, and the extremely worn condition of these teeth in the skulls of all the specimens which have come under my notice, would seem to indicate that they fed upon food which required more mastication than insects.

[3] From the Latin Pera, *a pouch*, and Meles, *a badger*.

The incisor teeth of the upper jaw are arranged so as to form a semi-oval figure; small, compressed, and when viewed from the outer or inner side, present nearly a square form; the two foremost are separated by a narrow space, the following three, on either side, form a continuous series with the first, but the fifth is usually more or less separated from the rest. The canine is moderate, or large, compressed, pointed, and somewhat recurved, and distinctly separated from the false molars, as well as from the incisors. The false molars are more or less separated by intervening spaces, compressed, and, when viewed externally, present a triangular figure, but at the base is a minute anterior and posterior cusp: the two foremost of these teeth are two-rooted; the third, which is in contact with the true molars, is sometimes three-rooted, and has a small tubercle on the inner side. The crowns of the true molars are nearly square, but broader on the outer side than the inner; the masticating surface of each tooth presents eight more or less sharply-pointed tubercles, of which four form a longitudinal series on the outer side of the tooth, two are situated in the mesial line of the tooth, are larger than the rest, and are joined by oblique ridges to the outer tubercles, so that they form the apices of two triangles, two of the smaller tubercles marking the angles at the base of each triangle; and, lastly, on the inner side of the tooth are two other tubercles situated opposite the two principal tubercles just described; their apices are much less elevated than those of the other tubercles; in some species they are of equal size, whilst in others the hindermost of these two eminences is very small [1]. The hindermost of the upper true molars, it must be observed, will not agree with the foregoing description, since the crown of this tooth is of

[1] This is important to notice, for we shall find that it is the absence of this posterior inner tubercle which gives the triangular form to the crowns of the true molars in the *Dasyuridæ*.

a more or less triangular form, and presents but five tubercles, or sometimes four tubercles, of which three form the outer side of the tooth, and the fourth, which is larger, is placed opposite the middle one of these, and there is an inner lobe which is not produced into a pointed eminence. The incisors of the lower jaw approach more or less to the longitudinal in their direction, and are in contact with each other; the four foremost are deeper from the outer to the inner side than in the opposite direction; the hinder one on either side is bilobed at its extremity. The canines are moderate. The false molars scarcely differ from those of the upper jaw, but sometimes want the small anterior tubercle. The true molars are rather longer and narrower than those of the upper jaw; they present two external and two internal principal cusps, and a very small anterior tubercle.

The genus *Isoodon* of Geoffroy and Desmarest is founded upon a supposed difference in the dental formula of *Perameles nasuta*, and *Perameles obesula*, which does not exist. That most excellent mammalogist, Desmarest, was but imperfectly acquainted with the *Perameles obesula*, and was misled (as was no doubt Geoffroy likewise) by the accounts given by others of the dentition of that animal.

Section 1. *Macrotis.*

Macrotis. REID, Proceedings of the Zoological Society for December, 1836, Pt. 4, p. 131.

Peragalea. GRAY, in Appendix to Gray's Journal of Two Expeditions in Australia, vol. 2, p. 401. 1841.

Ears very large; auditory bullæ in the form of a double bulb; tail long, and clothed with long hairs; tarsus long, the metatarsus clothed with hair beneath; innermost toe of the

hind foot wanting; lower half of the fibula firmly joined to the tibia; pouch with its opening directed towards the head of the animal[1].

The above are the principal points of distinction which present themselves upon comparing the *Perameles lagotis* (the only known species of the present section) with other species of *Perameles*: the differences are, several of them, comparative. In other species the tarsus is partially covered with hair beneath, but in none is it so much clothed as in the animal just mentioned. Of the inner toe of the hind foot there is no trace externally, and in the skeleton we find only a rudimentary metatarsal bone, whilst in the animals of the next section (Perameles proper) there are always one or two phalanges to the inner toe, and a small nailless tubercle is visible before the flesh is removed. The fur of the Rabbit-eared Perameles is remarkable, as compared with that of its congeners, for being extremely soft, and having no admixture of coarse and spiny hairs.

[1] Such appeared to me to be clearly the case in a stuffed specimen of the *Perameles lagotis* preserved in the museum of the Zoological Society. This specimen, which is the original of Mr. Reid's description, was stated to have been procured in Van Diemen's Land, but I was informed by the gentleman who sent it to England that this was an error, he having obtained it in the Swan River district. Before this specimen was mounted, and in some respects could then be more carefully examined, Mr. Reid ascertained that it possessed nine mammæ, or nipples, eight of which were arranged at equal distances from each other, and around the ninth.

PERAMELES (*Macrotis*) LAGOTIS.

Rabbit-eared Perameles.

Perameles lagotis. Reid, Proceedings of the Zoological Society for December, 1836, Pt. 4, p. 129.

" " Waterhouse, Naturalists' Library—Marsupialia, p. 153, Pl. 12.

Peragalea lagotis. Gray, List of the Specimens of Mammalia in the Collection of the British Museum, 1841, p. 96.

" " Gould, Mammals of Australia, Pt. 1, Pl. 12.

Native Rabbit of the colonists, and *Dalgheit* of the natives of Western Australia.

Plate 13, Fig. 1.

Ears very large, nearly as long as the head; fur very long and soft, of a pale grey on the upper parts of the animal, delicate vinous red on the sides, and white on the under parts: fore legs white, but dusky at the base externally; feet white, the hind feet clothed with black hairs on the under surface; the leg dusky immediately above the heel: tail at the root clothed with fur like that of the body, the remaining portion with coarse hairs, long on the upper surface (very long towards the end of the tail), and shortish on the under parts; on the basal half of the tail these hairs are black, and on the apical, white.

Inhabits Western Australia—Swan River district.

The very large and elongated ears of the present species no doubt suggested for it the name of "Native Rabbit," by which it is known to the colonists of the Swan River district, Western Australia—the only part of Australia, I believe, in which it has hitherto been found. According to the information furnished us by Mr. Gould, the Rabbit-eared Perameles is tolerably abundant over the whole extent of the grassy districts in the interior of the Swan River colony, and is

usually seen in pairs. It commonly selects those spots where, the soil being loose, it is enabled to excavate its burrows with facility. Like the Rabbit it flies to its subterranean retreat for safety, when pursued, and as the burrows are both deep and long, frequently eludes the pursuer. Its flesh is sweet, and resembles that of the Rabbit. The food of the Rabbit-eared Perameles consists of insects, and the animal is said to be particularly fond of a certain large grub (probably the larva of a large species of Buprestes, found abundantly in the district), which is found at the roots of the Acaciæ, and which is in equal request with the natives, who also eat it.

The specimen already alluded to as having lived in the menagerie of the Zoological Society, was very active in the evening, but usually slept during the day-time, when, sitting upon its haunches, with its head thrust between its hind legs, it appeared like a large ball of fur. It was an exceedingly savage animal, bit very severely, and would not readily unfix its hold of any thing it happened to seize with its teeth. When walking, the hind legs only were used, and these were very widely separated. The tail assisted slightly in supporting the body, which was but little raised in front.

The *Perameles lagotis* is about equal in size to the Common Rabbit, and has a remarkably long and pointed muzzle, which is not only naked at the tip, but a naked area runs back from that part, on the upper surface of the muzzle, and terminates in a point, distant nearly an inch from the end of the snout. The ears are nearly of an elongate oval shape, but are somewhat contracted near the apex, and form a cylindrical tube at the base: they are clothed only with extremely minute hairs, and these are for the most part very sparingly distributed, and of a pale colour; near, and at the anterior margin, they are more numerous; those next the margin are whitish, but at a short distance from the margin they are

brown. The eye is rather small, and is placed rather nearer to the base of the ear than the tip of the muzzle. The fur of the animal is very long, and extremely soft; on the upper parts of the body it is of a delicate grey hue; on the sides of the body of a pale vinous tint, or red inclining to purple; and on the under parts white: here the hairs are uniform to the root, but on the upper parts of the body they are pale grey next the skin, whitish above the middle, and have long dusky points. The muzzle is slightly suffused with black. The hairs of the moustaches are moderately long, and black. The fore legs are dusky at the base externally, but white below; the feet are also white, but the under surface of the hind foot is clothed almost entirely with longish black hairs; the black hairs extend along the outer side of the foot to the base of the outer toe, but on the opposite side the hairs assume a brownish hue on the palm of the foot, in the region of the joined inner toes There is a smallish naked space on the under surface of the heel, a second still smaller on the protuberance formed by the projecting bases of the inner metatarsal bones; the under surface of the toes is also naked, and there is a large fleshy pad at the base of the toes, which is destitute of hair. The tail is rather shorter than the body of the animal; at the root it is covered with fur like that of the body; the remaining portion has the first half black, and the terminal half white: the hairs covering these parts are dense and coarse, shorter on the under surface than the upper, being here about half an inch in length, or less towards the extremity; on the upper surface they average towards the base (on the black portion) about one inch in length, but they gradually become longer as they approach the tip of the tail, where they are as much as 2½ inches, or more, in length in some individuals. The extreme point of the tail is naked.

The male specimens are rather larger than the females.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	18	0	16	4
" of tail	9	6	9	7
" from nose to eye			2	5
" " to ear	4	6	5	2
" of ear	3	9	4	0
Breadth of ditto at the base ...	2	1	2	0
Length of fore foot, not including the claws			1	6
" of hind foot, not including the claws	3	10½	4	1

The skull of the *Perameles lagotis* is much elongated, especially in the facial portion; its zygomatic arches are thrown more boldly outwards, and are proportionately stronger than in other species; the interorbital space is more contracted, and the temporal fossæ are therefore larger; thus indicating greater powers in the muscles used in mastication, as does also the development of a sagittal crest: this, however, is very little raised. The muzzle is rather suddenly contracted in width immediately in front of the orbits, and is nearly of the same diameter from the tip as far back as the second premolar. The nasal bones are very long and narrow, and very little expanded behind: they are joined at the apex, in a skull in the museum of the Royal College of Surgeons, by two small bones, being part of the nasal cartilage, which is ossified, as in the Pigs. The palate presents two long and narrow incisive foramina, a large opening in the middle, the anterior boundary of which is in a line with the second premolar, and the posterior boundary in a line with the hinder margin of the second true molar; and on the back part of the palate are six small round openings, four of which are arranged nearly in the same transverse line, and the remaining two are placed in advance of the middle pair; the two outermost of the posterior row are partly bounded by the palatine bone, and partly by the palatine portion of the superior maxillary bone. The palatine bone, and palatal portions of the superior maxillary, interlace very singularly in the skull before me, the palatine bone running forwards so as to form three lobes, a broad central lobe, and a narrower one on either side, the interspaces being filled by the maxillary

bone. The auditory bullæ are chiefly formed by an expansion of the alæ of the sphenoid, but partly by the petrous bone; the sphenoidal portion is large, presents nearly an oval outline, is very convex, and runs, from within, obliquely forwards and outwards; the part due to the petrous element of the temporal bone is also convex, long, narrow, and runs parallel with the sphenoidal portion—it is comparatively small. The rami of the lower jaw are narrow in the vertical direction; the coronoid process is moderately elevated; the angular portion assumes the form of an isosceles triangle. The dimensions in the first of the two columns here subjoined are taken from a skeleton in the Royal College of Surgeons, and those in the second are from some parts of a skeleton in the British Museum: this latter must have belonged to a very large individual.

	Inches.	Lines.	Inches.	Lines.
Length of skull	4	1		
Width of ditto	1	9¾	2	0
" between orbits		5⅓		6
Length of nasal bones	1	9½	1	10½
Width of ditto behind		3¾		4
Length from posterior root of zygoma to apex of intermaxillary bones	3	5½	3	6
" of palate	2	3½	2	4¾
Width of ditto between penultimate molars		7¼		8¼
Length of great palatal opening ...		8		7¾
" of the foremost of the two auditory bullæ		7½		9
Transverse diameter of the same ...		4½		5⅓
Length of zygomatic arch	1	3	1	5
Depth of ditto in the middle ...		2½		3
From orbit to apex of nasal bones ..	2	1½	2	2¼
Length of lower jaw			3	3
Height of ditto in a vertical line dropped from the coronoid process			1	2½
Length of scapula	2	2⅔		
Width of ditto in the middle ...		11½		
Length of humerus[1]	2	1½		

[1] This is perforated between the condyles as well as on the inner condyle.

	Inches.	Lines.	Inches.	Lines.
Length of ulna	2	11	3	3
" of radius	2	4	2	6
" of fore foot	1	8	1	9
" of femur	3	0½		
" of tibia	3	9½	4	1½
" of hind foot	4	2	4	4
The outermost toe of the hind foot terminates short of the principal toe				9½
The joined toes terminate short of the principal toe				12½

The vertebræ are—cervical, 7 ; dorsal, 13 ; lumbar, 6 ; sacral, 1* ; caudal, 23.

With regard to the dentition I need only remark, that the hindermost incisor, on either side of the upper jaw, is separated from the preceding one by a very narrow space only (a space about equal to its own diameter) ; the canine teeth are larger than usual, sometimes being nearly half an inch in length ; the molar teeth have the transverse diameter greater than in other species of *Perameles*, and these teeth are not expanded on the outer side : the last molar is of the same form as the others, but of smaller size.

Section 2. *Perameles proper.*

Feet, tail, and ears, proportionately short ; the hind foot with a rudimentary inner toe, naked beneath in front, and at the heel. Fur distinctly composed of hairs of two kinds, the one forming a soft under fur, the other hairs coarse, flattened, and longitudinally grooved. Tail clothed with very short adpressed hairs only. Pouch opening backwards.

* But one vertebra joins the os innominatum, and none of the vertebræ in the sacral region are anchylosed.

PERAMELES MACROURA.

Thick-tailed Perameles.

Perameles macroura.	GOULD, Proceedings of the Zoological Society for February, 1842, Pt. 10, p. 41.
Thick-tailed Bandicoot.	GRAY, List of the Specimens of Mammalia in the Collection of the British Museum, p. 96. 1843.

Fur moderate as to length, and harsh to the touch; on the upper parts of the body pencilled with black and yellow in about equal proportions; on the sides of the body the yellow prevails; under parts yellow, or yellow-white: tail about equal to half the body in length, sparingly clothed with small stiff hairs; above black, beneath brown-white; ears moderate.

Inhabits North Australia.

The specimens upon which Mr. Gould founded his *Perameles macroura* were procured at Port Essington. It may be desirable to notice, with respect to the specific name selected, that it has reference to a comparison between the present species and the *P. obesula* and its allies, the tail of the *Per. macroura* being proportionately shorter than in the *P. lagotis*. Besides the bristly hairs which cover this animal, there is a scanty under fur of fine hairs, which, on the upper parts of the body, is of a brown-grey hue; on the under parts all the hairs are sometimes of a delicate yellow, and sometimes of a yellow-white tint throughout. The feet are brown-white; those of the hind legs, however, are indistinctly tinted with yellow. The tail resembles that of a Rat in being sparingly clothed with small stiff hairs, which are not so numerous as to hide the scaly skin beneath. The ears are of moderate size, have the hinder margin straight, and are clothed

with small hairs, of a yellow colour on the inner surface, and dusky on the outer, if we except the hinder part, where they are pale.

A male specimen in the British Museum collection presents the following dimensions :—

	Inches.	Lines.
Length from tip of nose to root of tail . .	16	0
" of tail	7	2
" from nose to ear	3	6
" of ear		10
Width of ditto		10
Length of fore foot and nails	1	7
(of which the nail of the largest toe is)		8
" of hind foot and nails	3	2
(of which the nail of the largest toes is)		7
Distance between posterior incisor and canine		$1\frac{1}{4}$
" between canine and first molar ...		$1\frac{1}{5}$
" between first and second molars ...		$0\frac{1}{2}$
From front of foremost incisor to the first true molar	1	1

Perameles macroura greatly resembles the *P. obesula*, but besides having the tail longer, it presents other differences ; attaining a larger size, and having the posterior upper incisor almost in contact with the others, and broader than in *P. obesula* ; the hind feet, moreover, are very nearly uniform in tint—not pencilled with black, as in the animal last mentioned. The skull I have had no opportunity of examining.

PERAMELES OBESULA.

Short-nosed Perameles.

Didelphys obesula (Porculine Opossum).	SHAW, Naturalists' Miscellany, vol. viii. Tab. 298; General Zool. vol. i. Pt. 2, p. 490.
Perameles obesula.	GEOFFROY, Ann. du Mus. iv. p. 64, Pl. 45.
Isoodon obesula.	(Geoffroy) DESMAREST, in Nouv. Dict. d'Hist. Nat. xvi. p. 409.
Perameles fusciventer.	GRAY, in the Appendix to Gray's Journal, ii. p. 407.
" *affinis.*	GRAY, List of the Mammalia in the British Museum, 1843, p. 96.

Head moderately long; fur very harsh to the touch; on the upper parts of the body pencilled with black and rich yellow in about equal proportions; on the under parts yellow-white: ears clothed with small hairs, yellow internally, and dusky brown externally, but paler towards the hinder margin; feet palish yellow, slightly pencilled with black. Tail short, clothed with small hairs, dusky above, and yellowish white beneath.

Inhabits New South Wales, South Australia, Western Australia, and Van Diemen's Land.

The hairs composing the fur of this animal are, as is most commonly the case, of two kinds; all that are visible (as the hairs lie in their ordinary position) are very harsh to the touch, flattened, pointed, and glossy; upon dividing these coarse hairs, a soft, but somewhat scanty, under fur is visible. On the upper parts of the body the coarse hairs, which are of moderate length, are greyish white at the root, black at the point, and broadly annulated with ochreous yellow at some little distance below the point; the under fur is grey: on the under parts of the body the coarse hairs are yellowish white, but almost pure white at the root, and the under fur is

white, or nearly so. Towards the end of the muzzle the hairs assume an uniform dusky brown hue; the lips, chin, and throat, are whitish. The hairs of the moustaches are weak, and by no means numerous. The ears are rather small, and tolerably well clothed with small hairs; those on the inner side are yellow, but towards the margin brownish; on the outer side they are dusky, but paler on the posterior part, and there is a faint indication of a pale spot at the base near the anterior margin. The fore feet are whitish; the tarsi are dirty white, tinted with yellowish, and freckled with blackish on the upper surface; on the inner side they are of a delicate yellow. The tail is about one third of the length of the body, or rather less, and clothed with small hairs; about one inch of the basal portion has the hairs longer, more nearly like those of the body, and variegated with black and yellow; beyond this part the upper surface is dusky; on the under surface the hairs are of a dirty yellowish tint.

The short-nosed Perameles (Porcaline Opossum of Shaw[1]) has an unusually wide range, being found in New South Wales, South Australia, King George's Sound, the Swan River district, and Van Diemen's Land. I have examined specimens from each of these localities, and taken much pains to satisfy myself of their specific identity. The males I have found usually larger than the females; their fore feet are proportionately larger, and so are the canine teeth.

The colouring varies somewhat in different individuals of *P. obesula*, and is darker than that of other species, if we except the *P. macroura*.

[1] I have examined the original specimen described by Shaw, and feel no doubt that it is a young individual of the present species. I may add, that the skull figured by Geoffroy in the Annales du Muséum, and supposed to belong to the same species, is decidedly that of *P. obesula*.

	Male. British Museum. Habitat?		Female*. British Museum. Van Diemen's Land.		Museum Zoological Society. New South Wales.		Female. New South Wales. Mr. Gould's Collection.		Males. Darling Downs, New South Wales. Mr. Gould's Collection.		Female? King George's Sound. British Museum.		Male. Perth, Western Australia. Mr. Gould's Collection.		Male. Perth. Adult, but not old. Weight 2¼ lbs.	
	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines
Length from tip of nose to root of tail ...	12	6	13	6	13	6	15	0	13	0	12	0	15	6	14	0
" of tail	4	3	4	3	4	6	5	0	5	3	4	3?	5	6	5	6
" from nose to ear	3	0	3	1	3	0	3	3	3	0	2	9	3	2	3	2
" of ear		8½		9		9		9		8½		8½		9		9
" of fore foot and nails	1	5½	1	5	1	5	1	6	1	7	1	5	1	6	1	5
" of hind foot and nails	2	6	2	5	2	5	2	8	2	7½	2	6½	2	8	2	7½

* On the stand of this specimen I find a note to the effect, that four young, of about an inch in length, were found in its pouch.

Usually, the upper parts of the body of this species are distinctly pencilled with black and yellow, and the under parts are of an impure white—not unfrequently yel-

lowish. The specimen from the Darling Downs, the dimensions of which are given in the fifth column, is of an unusually rich tint, the hairs on the upper parts of the body being pencilled with black and rich yellow-brown, inclining to orange; the under parts of the body are of a dirty yellow-white tint; the hind feet pale rusty brown; the inner surface of the ears is for the most part clothed with rich yellow hairs; externally the ears are blackish.

The skull of *Perameles obesula* differs from that of most other species of Perameles in having the muzzle less attenuated and less elongated, and the palate less imperfect—that is to say, the openings are proportionately smaller: the incisive openings are narrow, about three lines, or rather less, in length; a second pair of openings are situated opposite the first premolar; these are unusually small, varying from half a line to one line in length; the third or principal pair of palatine openings are sometimes divided and sometimes confluent; they commence opposite the principal premolar, and terminate very nearly in a line with the hinder margin of the second true molar. Besides these, there are four (sometimes only two) small round openings in the hinder part of the palatine bone, and two rather larger foramina, one on either side at the back of the palate. The auditory bullæ are rather large, (larger than in *P. myosuros* and *P. fasciata*), having the largest diameter from 6 to 5½ lines in the skulls of which the dimensions are given. The hindermost upper incisor is smaller than the fourth, pointed, and situated nearer to the preceding incisor than in most other species, there being at most a space of three quarters of a line in six skulls examined, but usually about half a line.

	Male, mature, but not old *.		Male, aged.		Female, aged.		Sex? aged; from Western Australia.		Sex? very aged; Western Australia†.		From skeletons in the College of Surgeons, from Van Diemen's Land.				Male, adult, but not old. From Perth, W. Australia‡.		*Per. macroura?*§ Brit. Mus.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins	Lines.
Length of skull	2	7	2	$7\frac{1}{4}$	2	6	2	7	2	$10\frac{1}{3}$	2	$8\frac{1}{2}$	3	0	2	9	2	$8\frac{1}{3}$
Width of ditto	1	2	1	$2\frac{1}{4}$	1	$1\frac{1}{4}$	1	$1\frac{1}{8}$	1	3	1	$2\frac{1}{4}$	1	$4\frac{1}{3}$	1	$2\frac{1}{2}$	1	$2\frac{1}{2}$
Length of nasal bones	1	$0\frac{3}{4}$	1	$0\frac{1}{2}$	1	$0\frac{3}{4}$	1	$0\frac{3}{4}$	1	2	1	0	1	$3\frac{1}{2}$	1	$1\frac{1}{2}$	1	$1\frac{1}{2}$
Width of ditto behind		$2\frac{1}{3}$		$2\frac{1}{2}$		$2\frac{1}{4}$		$2\frac{1}{4}$		$2\frac{1}{3}$		$2\frac{1}{2}$		3		$2\frac{2}{3}$		$2\frac{2}{3}$
From front of foremost incisor to back of last molar	1	5	1	$4\frac{1}{3}$	1	4	1	4	1	$5\frac{1}{2}$	1	5	1	$7\frac{1}{2}$	1	5	1	$6\frac{1}{4}$
Length of four true molars, taken together		6		$5\frac{2}{3}$		$5\frac{1}{2}$		$5\frac{1}{2}$		$4\frac{3}{4}$		$5\frac{2}{3}$		6		$5\frac{3}{4}$		$7\frac{1}{3}$
" of palate	1	$6\frac{1}{2}$	1	6	1	$5\frac{1}{3}$			1	$7\frac{4}{5}$	1	$6\frac{1}{3}$	1	$9\frac{3}{4}$	1	$6\frac{2}{3}$	1	$7\frac{1}{2}$
Width between orbits		$5\frac{2}{3}$		6		6		6		$5\frac{2}{3}$		$5\frac{2}{3}$		6		$5\frac{3}{4}$		$5\frac{1}{4}$
Length of lower jaw to angle ...	2	$0\frac{1}{2}$	2	1	1	$11\frac{2}{3}$	1	$11\frac{1}{2}$	2	3					2	1	2	$1\frac{1}{3}$
Height, from apex of coronoid process		$8\frac{1}{2}$		$8\frac{1}{2}$		$8\frac{1}{4}$		8		$9\frac{1}{2}$						9		$9\frac{1}{4}$

* This skull was removed from the specimen the dimensions of which are given in the first of the columns at p. 370.

† It will be observed that, notwithstanding this skull is larger than most others, its molar teeth give a smaller dimension. The skull increases in size, to a certain extent, with the age of the animal, but of course not the teeth; these are *not only* worn at the crown, but are worn in front and behind by the *friction* of adjoining teeth—where there are any.

‡ The dimensions of the specimen from which this skull was removed are given in column 8 at p. 370.

§ The skull from which the above measurements are taken I am convinced belongs to an *animal* distinct from, though nearly allied to, the *Per. obesula*, and as in the structure of its incisor teeth it agrees *only* with the *P. macroura* (a species, it will be remembered, also close to *P. obesula*), I suspect it will prove to belong to that animal; if so, we shall have to add to its characters, that its palate is destitute of any perforations between the principal palatine openings and the incisive *foramina*; that the principal palatine openings, situated opposite the anterior two true molars, are small, being only $2\frac{1}{2}$ lines in length; and, lastly, that the molar teeth are nearly double the size of those of *P. obesula*, the skulls being of equal size. The posterior incisor of the upper jaw is very nearly in *contact* with the fourth, and is broader than in *P. obesula*.

Perameles affinis. Gray.

Is founded upon a small animal from Van Diemen's Land, which appears to me to be a young individual of the *P. obesula*: excepting in size I can perceive no difference: its length from the tip of the nose to the root of the tail is 8 inches. When of this size, the young *P. obesula* has so much the general appearance of an adult animal, in the character of the fur, &c., that I supposed, like Mr. Gray, there really existed a second species resembling the *P. obesula*, but after seeing the skulls removed from two such specimens I was convinced that their small size merely indicated immaturity: they wanted the two or three back molar teeth.

Perameles fusciventer. Gray.

Two specimens in the British Museum collection are labelled *Perameles fusciventer*; one agrees in every respect with the *P. obesula*, excepting that its head is rather shorter: its dimensions are given in the sixth column of admeasurements in p. 370. The other is considerably smaller than the adult *P. obesula*, and differs in being more strongly pencilled with black on the upper parts of the body, and in having the under parts of the body of a pale brownish yellow, and the hairs on this part are slightly tinted with grey at the root. The head bears the same proportion to the body in length, as in *P. obesula*. Its dimensions are—

	Inches.	Lines.
Length from tip of nose to root to tail ...	9	0
" of tail	3	0
" from nose to ear	2	2
" of ear		7½
" of fore foot and nails		11½
" of hind foot and nails	1	11½

I question much whether the shortness of the head in the larger specimen does not arise from the mode in which the specimen has been stuffed, and with regard to the yellowish tint of the abdomen, I may observe, that in specimens which are undoubtedly the *P. obesula*, the under parts of the body are sometimes tinted with yellow, though less strongly than in the little animal above described. I cannot see any good grounds for regarding the specimens called *fusciventer*, as specifically distinct from the *P. obesula*.

PERAMELES NASUTA.

Long-nosed Perameles.

Perameles nasuta. Geoffroy, Annales du Muséum, tom. iv. p. 62, Pl. 44.
" *nasuta* and *aurita*, of the Paris Museum.
" " Waterhouse, Nat. Libr. (Marsupialia) vol. xi. p. 155. Pl. 13.
? " *Lawsoni.* Quoy et Gaimard, Voyage de l'Uranie—Zoologie, p. 57, and p. 711.

Muzzle much elongated; ears moderate: general colour pale brown; on the sides of head and body of a very pale vinous red; under parts of body and feet yellowish white; tail brown above, dirty white beneath.

Inhabits New South Wales.

The Long-nosed Perameles, as its name implies, has the muzzle more elongated than in other species of the present section: its fur is almost entirely composed of harsh and flattened hairs, but there is a scanty under fur of fine hairs, which are of a pale grey colour on the upper parts of the body. The longer and coarser hairs on the back have their

visible portions pencilled with pale brown, and blackish; on the sides of the body the black is almost entirely absent, and here, as well as on the sides of the head, the general tint is purplish red, but very pale. The under parts of the body are yellowish white, and the hairs on these parts are uniform to the root. The feet are dirty white; the fore leg is greyish at the base externally, and there is a dusky patch immediately above the heel of the hind foot. The ears are of moderate size, broad at the base, and considerably attenuated at the opposite extremity; they are clothed with very small hairs, whitish on the inner side, and dusky on the outer, but pale brown near the anterior angle. The tail is furnished with small stiff hairs, dusky or brownish on the upper surface, and dirty white on the under.

	Mus. Zool. Soc.		Brit. Mus.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	16	0	16	0
" of tail	4	6	5	0
" from nose to ear	4	0	4	1
" of ear	1	2	1	4
" of fore foot and nails			1	11*
" of tarsus, including the nails	3	2	3	5

The cranium of the *Perameles nasuta*, according to Geoffroy's figure in the Annales du Muséum, is 3¾ inches in length; from the orbit to the apex of the intermaxillaries, 2 inches 1½ lines; from the front of the upper foremost incisor to the canine, half an inch; from the front of the first incisor to the back of the last molar, 1 inch 10¾ lines; from ditto to first true molar, 1 inch 3½ lines.

In a specimen in the British Museum, I find the fourth and fifth incisors of the upper jaw separated by a space of two lines, and from the front of the foremost incisor to the same

* The longest nails of the fore foot in this specimen are 10½ lines in length, and of the hind foot 8½ lines.

part of the first true molar measures 1 inch $4\frac{1}{4}$ lines. A naked space on the upper side of the muzzle extends backwards nearly three quarters of an inch.

Perameles Lawsoni. QUOY et GAIMARD.

A large species (of Perameles), state the authors above mentioned, was given to us at Bathurst, beyond the Blue Mountains. It was perhaps about two feet in length, from the head to the extremity of the tail: its fur was reddish brown above, and yellowish beneath. It was lost in the shipwreck of the Urania. At p. 711 of the "Zoologie de l'Uranie," the name of ***Perameles Lawson*** is proposed for this species.

Such are the slender grounds upon which the ***Perameles Lawsoni*** is inserted into catalogues of the species of Mammalia—a description evidently given from memory; and which, after all, does not include any peculiarities by which the animal may be distinguished from the ***Perameles nasuta***, a specimen of which in the British Museum differs only in being three inches short of the *guessed* size of ***P. Lawsoni.***

PERAMELES GUNNII.

Gunn's Perameles.

Perameles Gunnii. **GRAY, Proceedings of the Zoological Soc. for January, 1838, Pt. 6, p. 1; Annals of Nat. Hist. for April, 1838, Vol. i. p. 108.**

" " **WATERHOUSE, Naturalists' Library (Marsupialia), p. 156, Pl. 15.**

Upper parts of body grey, pencilled with yellow and black; under parts white, hinder part of back blackish, with white bands: ears with yellowish hairs internally, exter-

nally dusky, but pale yellow behind, and yellow at the anterior angle; feet and tail white; the latter with a small dusky patch at the base, above.

Inhabits Van Diemen's Land.

Mr. Gunn, who was the discoverer of the present species, and after whom it has been named, informs us, that it is known in Van Diemen's Land as the *Bandicoot*, and states that Bandicoots are numerous in all parts of that island: they burrow in the ground, and live principally upon roots. Certain species of bulbs, cultivated by Mr. Gunn, suffered much from the attacks of the Bandicoots, and a case is mentioned by that gentleman in which a whole collection of Cape bulbs was destroyed by them.

In size and general proportions the *Perameles Gunnii* closely resembles the *P. nasuta*, but it is readily distinguished from that animal by the white bands which adorn the hinder parts of its body, and the dark ground colour of the same parts: the colouring of other parts scarcely differs from that of *P. nasuta*. Its fur is moderate as to length, and harsh to the touch, though less so than in *Per. obesula* or *P. nasuta*: on the upper parts of the body the hairs are grey at the root, but the visible portion of each hair is pencilled with black and ochreous yellow; on the sides of the body the general hue is somewhat paler than on the upper parts, the hairs having very little of the black pencilling; and here a delicate vinous tint is perceptible: on the hinder third of the back the ground colour may be described as black, there being but little admixture of yellow, but on this part are four broadish white bands; the first of these bands (which are of about equal width to the dark interspaces) crosses the back rather in front of the line of the thigh; the other three radiate, so that the second is most nearly transverse, and the hindermost is longitudinal; a mesial dark line divides, or separates, all

the bands. The under parts of the body are pure white, and the hairs are here uniform to the root; the feet and tail are also white, but the latter has a small dusky patch on the upper surface, at the base; and, on the sides of the heel of the hind foot, the hairs are dusky, as are likewise those which form the fringe partly covering the under surface of the foot; a dusky patch is also observable immediately above the heel. The muzzle is slender, and much elongated; the ears are moderate, broad at the base, and attenuated towards the opposite extremity; internally they are clothed with very small pale yellow hairs, and externally they are also chiefly clothed with yellow hairs, but on the hinder part they are nearly white, and a broad dusky mark obliquely crosses the outer surface of the ear, commencing about the middle of the anterior margin, and running obliquely backwards as it descends to the base.

A species greatly resembling the present animal inhabits the main land; it is the *P. fasciata* of Mr. Gray, and at the end of the description of that animal will be found pointed out the distinguishing characters.

	Inches.	Lines.	
Length from tip of nose to root of tail ...	16	6	
" from nose to ear	4	4 or 4	5
" of ear	1	2 or 1	3
Width of ditto		11	
Length of fore-foot and nails	1	6	
(of which the longest nail is		6)	
" of hind-foot and nails	3	0	
(of which the nail of largest toe is ...		6)	
" of tail, about	4	0	
Space between the fourth and fifth upper incisors	0	$1\frac{1}{8}$	
From front of foremost upper incisor to front of first true molar	1	$2\frac{1}{2}$	

PERAMELES FASCIATA.

White-banded Perameles.

Perameles fasciata. GRAY, in the Appendix to Capt. Grey's Journals of Two Expeditions of Discovery in North-west and Western Australia, Vol. ii. p. 407.

Fur moderately long, and harsh to the touch; on upper parts of the body pencilled with black and yellow in about equal proportions; on the sides of the body the yellow prevails, and on the hinder part of the back the black prevails as a ground colour; but here are three broad yellow-white bands, the foremost of which crosses the back, the other two run obliquely downwards and backwards from the mesial line; the hindermost of these two is almost longitudinal, and the one in front of this joins the foremost band—these bands are interrupted on the middle of the back; the feet and under parts of the body are white; the tail is also white, but along the whole upper surface the hairs are partly black and partly yellow, but chiefly the former.

Inhabits Liverpool Plains, and South Australia.

The ears of this species are rather long, very broad at the base, and much attenuated towards the opposite extremity; the posterior margin is indistinctly emarginated; they are clothed with very small adpressed hairs; those on the inner surface are yellowish white, and those on the outer of a pale rusty yellow, but blackish on the fore part, if we except an orange-coloured spot at the base, joining the anterior angle. As in *Per. Gunnii*, the fringes of hairs bordering the sides of the tarsus are dusky. The hairs on the under parts of the body are uniformly white; those on the upper parts are pale grey at the root, rusty yellow near the point, and black at the point. The under, softer fur, is dense on the upper parts of

the body, especially over the haunches; but on the under parts the softer fur is scanty.

	Inches.	Lines.
Length from nose to root of tail	11	6
" of tail	4	0
" of tarsus	2	3⅓
" of ear	1	2¼
" from nose to ear	3	1

The *P. fasciata* differs from *P. Gunnii* in being smaller, in having the ears proportionately rather longer, and broader at the base; the tail longer, and dusky along the whole upper surface—(the dark colour not confined to a very small space at the base, as in *P. Gunnii*); the feet more slender, and the muzzle also more slender. The following dimensions, being from two specimens (one of each species) of very nearly equal size, will convey an idea of the amount of difference in the proportions. As the adult of one species is larger than that of the other, of course one of these specimens was younger than the other.

	PERAMELES FASCIATA.		PERAMELES GUNNII.	
	Inches.	Lines.	Inches.	Lines.
Length from nose to tail	11	3	11	9
" of tail	4	0	2	8
" of tarsus and toes, including the nails	2	3½	2	5½
" from nose to ear	3	6	3	1½
" of ear	1	2½		11½
Breadth of ditto at the base		11½		9
Length of fore-foot to end of nails ...	1	2	1	2
" of longest toe of hind-foot, including the nail		10⅗	1	0½
" of outer toe and nail		5		5¾

A skull of *Perameles fasciata* in the British Museum collection, agrees very closely in size and general proportions with skulls of the *P. myosuros* in the same collection; it is, however, narrower, and the teeth are smaller—the canine is very small: the second pair of palatine openings are rather

larger, and the principal opening in the palate is smaller. The lower jaw is more slender. The dimensions are :—

	Inches.	Lines.
Length	2	6
Width	1	0
Length of nasal bones	1	1
Width of ditto, behind		$2\frac{1}{2}$
" " in front		$1\frac{1}{3}$
" of interorbital space		$6\frac{1}{2}$
Length of palate	1	6
Space between fourth and fifth upper incisors		$1\frac{1}{8}$
" " fifth incisor and canine		$1\frac{1}{4}$
" " canine and first premolar ...		2
" from front of foremost incisor to back of last true molar	1	$4\frac{2}{3}$
" *of four true molars, taken together* ...		$5\frac{1}{3}$
" of incisive openings		$3\frac{1}{4}$
" of second pair of palatine openings ...		4
" of principal palatine openings		$3\frac{2}{3}$
Length of lower jaw...	2	0
Height of ditto from apex of coronoid process ...		$6\frac{1}{4}$

PERAMELES MYOSUROS.

Saddle-backed Perameles.

Perameles myosuros. WAGNER, Schreb. Saug., Pl. 155, A. d., Pt. 111, 112, Nov. 1842. GOULD, Mammalia of Australia, Pt. 1, Pl. 2.

" *arenaria.* GOULD, Proceedings of the Zoological Society for June, 18:4, Pt. 12, p. 104.

Muzzle very slender, and much elongated ; ears rather large ; tail moderate ; fur rather long : general colour of upper parts brownish ; under parts of the body, feet, and tail, white, indistinctly suffused with yellowish ; the latter with the upper surface dusky ; ears with a broad dusky band externally, a large orange patch in front at the base, and the

hinder part whitish yellow: a broadish dusky band crosses the hinder part of the back.

Inhabits the Swan River district, Western Australia, and the neighbourhood of King George's Sound.

The present animal has received the name of the Saddle-backed Perameles from Mr. Gould, on account of its having a large and nearly circular area on the back, which is of a darker hue than other parts, if we except the transverse band which crosses the lumbar region, a little in front of the hind leg: with respect to this dusky patch, it must be remarked, however, that it is extremely indistinct, and it appears to me that it would be more accurate to describe the animal as having a crescent-shaped band, of a rather paler hue than the ground-colour of the back, immediately in front of the dark band on the lumbar region; this pale band, which corresponds to the foremost of the bands in *P. fasciata* or *P. Gunnii*, combined with the sides of the body being paler than the other parts, causes the appearance of the dark area referred to.

The under fur in *P. myosuros* is unusually plentiful, especially on the hinder parts of the back, and is of a whitish grey colour; the longer flattened, harsh hairs, are grey-white at the root, and rusty yellow near or at the point; on the back are many which are black at the point, and these produce the darker general hue of that part: on the under parts of the body the hairs are uniform to the root, white, but slightly suffused with yellow; the feet and tail are of the same colour, but the small hairs on the upper surface of the latter are partly yellowish, but chiefly black. The ears are rather long, very broad at the base, and rather suddenly contracted at the apical portion; their hinder edge is somewhat emarginated; on the inner side they have pale yellow hairs, and externally they are clothed with minute hairs of the same

yellow hue on the hinder part; a largish bright rusty yellow, or orange-coloured spot, is observable at the anterior angle, and a broad dusky band crosses the middle, running from the anterior margin, obliquely backwards and downwards. A delicate brownish red tint is observable on the sides of the body. The tail is clothed throughout with very small stiff hairs, which are sufficiently numerous, however, to hide the scaly skin beneath, in the specimens which I have examined, though it appears they are less numerous in the specimen described by Prof. Wagner[1]. The naked portion of the muzzle terminates in a point about $\frac{1}{6}$ of an inch behind the line of the nostril openings.

	Inches.	Lines.
Length from tip of nose to root of tail ...	11	0
" of tail	3	6
" of ear	1	3
" of tarsus, including the nail ...	2	4
" from nose to ear	3	1

The Saddle-backed Perameles, according to Mr. Gould, "inhabits the whole line of coast of the Swan River colony, but is apparently not found to the westward of the Darling range of hills. It resides in the densest scrub; thickets of the seedling *Casuarinæ* being its favourite resort. It makes a compact nest in a hollow on the ground, of grasses and other materials, which assimilate so closely in colour and appearance to the surrounding herbage, that it is very difficult of detection, the difficulty being much increased by the nest having no visible opening for the ingress and egress of the animals. The nests are generally inhabited by pairs: the young are either three or four in number.

"Its food consists of insects, seeds, &c. It excavates holes

[1] D. Wagner says the tail is similar to a rat's tail: the tail of the animals before me will not bear this comparison, being much more densely clothed than in the common rat, which of course must be the one referred to.

in the earth with rapidity and ease, and to these, and the hollow trunks of fallen trees, it flies for shelter when pursued by its enemies.

"Mr. Gilbert remarks, that this species is, without exception, the most difficult to skin of all the Marsupials with which he is acquainted; the skin is, in fact, so tender, that the weight of one of the limbs, if left hanging by the skin, is sufficient to separate it from the body."

I am indebted to Mr. Neill, of King George's Sound, for a drawing, and some notes, of a species of Perameles, which that gentleman informs me is found to the westward of King George's Sound only. The animal (which is there known to the natives by the name of "Gnemmel"), judging from these materials, and also from some parts of the skeleton, also forwarded to me, is clearly the *Perameles myosuros*. The specimen drawn by Mr. Neill lived for several weeks in confinement: its food, which consisted of raw mutton and insects, Mr. Neill states, was encircled by its long tongue, and conveyed by that organ to the mouth, piece by piece, with the greatest rapidity. The natives state that it makes a nest composed of sticks, straws, &c.

The skull of *Perameles myosuros* is of a more delicate make than that of *P. obesula*. In this latter animal, the cranium, when old, presents a slight trace of sagittal crest, but in *P. myosuros* the temporal ridges can scarcely be traced, and never meet: its form is more elongated; the muzzle is more attenuated, and the zygomatic arch is more slender. As would be anticipated, these differences are accompanied by a reduced size in the teeth; and, the muzzle being longer in *P. myosuros*, some of the teeth are more widely separated from those which precede, or follow them in the series; thus the fifth incisor is more widely separated from the fourth, or from the canine, and between this latter tooth and the premolars, as well as between the two foremost of the

premolars, the spaces are greater. The upper true molars differ from those of *P. obesula* in having the posterior internal lobe distinctly smaller than the anterior one. The lower jaw in the animal under consideration is much more slender than in *P. obesula*, and has the condyloid and coronoid processes less elevated.

	Inches.	Lines.
Length of skull	2	8½
Width of ditto	1	1¼
Length of nasal bones	1	1½
Width of ditto behind		2½
" " in front		1⅓
" " between orbits		7
Length of palate		
Space between fourth and fifth upper incisors		1¼
" " fifth incisor and canine ...		1½
" " canine and fifth premolar ...		1⅓
" from front of foremost incisor to back of last molar	1	5½
Length of four true molars taken together ...		5⅓
" of incisive openings		4¼
" of second pair of palatine openings		3½
" of principal palatine openings ...		4¾
" of auditory bullæ		4
" of lower jaw	2	0⅓
Height of ditto from the apex of the coronoid process		7¼

PERAMELES BOUGAINVILLEI.

Bougainville's Perameles.

Perameles Bougainvillei. QUOY et GAIMARD, Zoologie du Voyage de l'Uranie, p. 56, Tab. 5. Bulletin des Sci. Nat. 1824, tom. i. p. 270.

Muzzle attenuated; eyes tolerably large; ears ovate; fur moderately harsh; that on the upper parts of the body of a rusty

tint, and that on the under parts, and inner side of limbs, rusty grey: tail rusty brown above, and greyish beneath; claws yellowish.

Inhabits Peron's Peninsula—in Shark Bay, Western Australia.

The dimensions of this species as given by Messrs. Quoy and Gaimard, reduced to English measure, are as follow:—

	Inches.	Lines.
Length from tip of nose to root of tail ...	6	6
" of head	1	10½
" of tail	2	8
" of fore legs	1	5
" of hind legs	2	8

The small size of this animal, and its having the teeth but little developed, caused MM. Quoy and Gaimard to suspect it might be young; these authors say, however, that they saw many specimens all of which were of the same size. The skull, represented on the same plate with the animal, and of the natural size, shows the four true molars as perfectly developed, a circumstance of itself sufficient to prove that the animal to which the skull belonged was adult. The cranium has lost the occiput, but, making allowance for this part, it would be considerably smaller than that of any other known species of *Perameles*: its length, when entire, indeed, could not have been more than two inches.

PERAMELES DOREYANUS.

New Guinea Perameles.

Perameles doreyanus. Quoy et Gaimard, Voyage de Découvertes de l'Astrolabe—Zoologie, tom. i. p. 100, Pl. 16, figs. 1—5.

Head conical; the muzzle long, and tolerably thick; eye small, the pupil linear, and in the direction of the muzzle; ears

large, and somewhat rounded; limbs short and stout; the outer and inner toes of the fore feet clawless: all the claws strong, short, slightly arched, and rounded above and beneath: fur harsh; of a rusty brown colour on the upper parts of the body—a tint produced by the admixture of blackish brown harsh hairs with others of a finer quality, and golden rusty colour; sides of the body of a pale hue; under parts, and inner sides of the limbs, pale yellowish; ears yellowish, and destitute of hair, excepting on the anterior margin: toes of the hind feet covered with pale yellowish hairs; tail short, and but sparingly furnished with short harsh hairs.

Inhabits New Guinea.

	Inches.	Lines.
Total length	19	5
Length of head	4	4
Distance between ears	1	3
Length of ears	1	1
Width of ditto		9¾
Length of anterior members about	3	3
" of posterior ditto	5	9
" of tail	3	5

The above is the description given by Messrs. Quoy and Gaimard, but slightly abbreviated. With regard to the dentition, it is stated the *Perameles doreyanus*[1] has in all 46 teeth; the two wanting to complete the number found in other species of *Perameles*, are, two incisors of the upper jaw, eight only being enumerated in the dental formula given. Possibly these teeth may at one time have existed in the skull, but had been lost whilst the animal was alive, in which case the sockets would soon become obliterated. A skull of an aged specimen of *Perameles obesula*, now before me, has but eight incisors in the upper jaw, the foremost pair having been lost,

[1] M. Lesson arranges this animal under a new generic title, in his Nouveau Tableau du Règne Animal. It will be found under the name *Echymipera Kalubu*, in that work (see p. 192).

and the sockets filled with bone: from the condition of the second pair it is probable they would soon likewise have been cast.

The specimen described by Messrs. Quoy and Gaimard was procured at Dorey Harbour; hence its name.

Perameles Harveyi and *Perameles Tuckeri*.

The so-called species of Perameles, named *Harveyi*[1] and *Tuckeri*[2], must be expunged from our lists. The former was founded by myself upon an imperfect skin, from South Australia, which I have since discovered appertains to the *Hypsiprymnus Graii*. The latter I had an opportunity of inspecting soon after it was described by Mr. Gray, and found, upon examining its teeth, &c., to be also a species of *Hypsiprymnus*; indeed, I could perceive no difference between this animal and the *Hypsiprymnus murinus*.

Genus, *Chœropus*[3].

Chœropus. OGILBY, Proceedings of the Zoological Society for March, 1838, Pt. 6, p. 26.

Peramelidæ having very slender limbs; the fore feet provided with two toes only, and these small, equal, and furnished with short, compressed nails; the hind feet with but one well developed toe, the joined toes being very small, and far removed from the extremity of the foot; and the outer toe being represented by a mere tubercle, placed about midway between the extremities of the foot. All the toes of the hind foot are provided with nails.

[1] Proceedings of the Zoological Society, Part 10, p. 47.
[2] Annals of Natural History, vol. i. p. 150.
[3] From χοῖρος, a hog; and ποῦς, foot.

The present genus was founded by Mr. Ogilby upon a singular little animal discovered by Sir Thomas Mitchell on the banks of the River Murray. The animal was presented to the Natural History Museum at Sydney, but a careful drawing, and some notes, were brought to England, and upon these Mr. Ogilby's account is drawn up. More recently, specimens of the Chœropus have been procured by Mr. Gould, and by Capt. G. Grey, and are now deposited in the British Museum. From these we learn that Mr. Ogilby's original conjecture as to the affinities of the animal, is correct—that it is allied to Perameles. The structure of the skull and teeth is very nearly the same as in Perameles. In the number of the teeth I have good reason to believe *Chœropus* does not differ from Perameles[1]. The five incisor teeth on each side of the upper jaw are contiguous, and rather less compressed than in Perameles, being slightly convex on the outer surface, and their apices are not truncated as in the species of the genus just mentioned, but terminate in a somewhat obtuse point. The canine is rather small, but comparatively broad from front to back, and is formed nearly like the premolars: it is distant about three quarters of a line from the incisors. The first false molar is separated from the canine by a space of 1½ lines, and from the second false molar by about three quarters of a line; the second and third false molars, and the four true molars, form a continuous (or very nearly continuous) series. These teeth, as represented in the drawing kindly lent me by Prof. Owen, do not appear to differ in structure from those of *Perameles*. With regard to the teeth of the lower jaw, I have only to remark, that the incisors are broader (the hindermost one distinctly so) than in *Perameles*.

The cranium is shorter, and the cerebral portion is broader,

[1] The only teeth which I have not seen are the back molars of the lower jaw.

than in *Perameles;* but the muzzle is very narrow. The ears are larger than usual in the genus last mentioned. The limbs are longer, and remarkable for their slenderness, the fore legs being scarcely as thick as an ordinary sized goose-quill. The two toes with which they are terminated are very small, and provided with small, compressed, and but little curved, nails; they have each an oblong fleshy pad on the under surface, behind which is a second flesby tubercle, but this latter is very small. The two toes most probably correspond to the second and third, since the fourth is the smallest of the three developed toes in Perameles. The hind legs are distinctly longer than the anterior, and almost equally slender; the foot is long, and at first glance appears to have but one large toe, the other toes being very small, and far removed from the extremity of the foot; the little outer toe is placed about midway between the extremities of the foot, and has a small conical nail: the joined inner toes are almost as small; they have hollow nails, and are placed rather in advance of the outer toe. The tarsus is entirely covered with hair beneath, if we except a small tubercle situated at the commencement of the anterior third of the foot. The great developed toe has a large fleshy pad at its extremity on the under surface, and terminates in a nail in the form of a compressed cone. From these circumstances it would appear that the heel is not applied to the ground. The tail is short and slender. The pouch opens backwards, as in *Perameles.*

CHŒROPUS CASTANOTIS.

The Chœropus, or Pig-footed Perameles,

(*Plate* 13, fig. 2.)

Chœropus ecaudatus.	OGILBY, Proceedings of the Zool. Society for March, 1738, Pt. 9, pp. 25-6. Perameles ecaudatus, Ogilby, in Mitcheh's Journal, ii. p. 131, Pl. 27.
" *castanotis.*	GRAY, Annals of Natural History for March, 1842, vol. ix. p. 42.
" "	GOULD, Mammals of Australia, Pt. 1. Pl.

Fur long, loose, and rather soft to the touch; on the upper parts of the body of a brown-grey tint, and on the under parts white, or yellowish white; ears clothed with very small hairs, which are chiefly of a rusty yellow colour, but are dusky towards the point of the ear: fore feet whitish; tarsi pale *rufous*; the great central toe dirty white. Tail clothed with short hairs, but those on the upper surface distinctly longer than elsewhere; the sides, under surface, and tip, brown-white; the upper surface, black.

Inhabits South Australia.

Such is the colouring of one of two specimens in the collection of the British Museum; the other specimen differs in having the general tint of the body brown, and suffused with rust colour, especially on the flanks: the limbs are also tinted with pale rusty red. The fore feet, and the large toe of the hind foot, are whitish; the tail is of a pale rust colour, if we except the longer hairs of the upper surface, which form a black crest[1]. The under parts of the body are rusty white. The dusky or blackish hue of the apical portion of the ear is more extended on the outer surface of that organ than on the inner, in both specimens, and the fur, both on

[1] These longer hairs are less than a quarter of an inch in length.

the upper and under parts of the body, is grey at the root. The under fur is more abundant than in *Perameles obesula*, and some others, and in this respects resembles that of the *P. myosurus*; the longer interspersed hairs are less harsh than usual in the *Peramelidæ*. The ears are very broad at the base, and much attenuated at the opposite extremity, and their hinder edge is emarginated.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	9	6	11	0
" of tail	4	0	?	
" from nose to ear	2	7	2	8
" of ear	1	11	1	10
Width of ditto at the base	1	2½	1	3½
Length of fore leg, about	2	6	2	8
" of fore foot	1	0½	1	1½
Of which the two toes and nails of ditto are		5½		5¼
The nails being		2		2½
Length of tarsus	2	7¾	2	8
Of which the great central toe is ...	1	0	1	0¼

Sir Thomas Mitchell, in his notes on the Chœropus, especially mentions the total absence of a tail as a remarkable peculiarity in the animal, and hence the specific name *ecaudatus* was applied to it by Mr. Ogilby; since, however, other specimens, agreeing essentially with the *Chœropus ecaudatus*, have subsequently been discovered—and one of these, I may observe, was found in the same district as Sir Thomas Mitchell's animal—we can scarcely refuse to believe that the latter specimens are specifically identical with the former, and that the peculiarity in question is due to some accident. Two examples of the Chœropus are contained in the British Museum collection, one of which was presented by his Excellency George Grey, Esq., and is from South Australia; the second is from the Swan River district, where, according to Mr. Gould, the species is confined to the interior of the country. Its food is said to consist of insects and

vegetable substances; and the author just mentioned states that it forms a nest, composed of leaves, &c.; in these respects resembling the species of *Perameles*.

DASYURIDÆ, OR DASYURUS FAMILY.

Dasyuridæ. WATERHOUSE, Transactions of the Zoological Society, vol. ii. Pt. 2, p. 149.—Naturalists' Library, vol. xi.
Dasyurina. GRAY, Annals of Philosphy, xxvi. 1825.

Marsupialia having the second and third toes of the hind foot disunited, and well developed; the thumb, or first toe, small, or absent; the tail non-prehensile, and hairy; eight incisors in the upper jaw, and six in the lower; the canine teeth well developed; the molar teeth either with trenchant crowns, or with the masticating surface presenting numerous prickly points. Stomach simple: no cœcum marking the division of the large and small intestines.

With respect to the above, which are the chief distinguishing characters of a group of Marsupial animals whose diet is either carnivorous or insectivorous, it is necessary to observe, that the Myrmecobius has yet to be dissected; hence we are not sure that the cœcum is absent in that animal.

Several fossil species of this family have been found in Australia, to which continent the recent species are also confined—with one exception only, the *Phascogale melas*, which is a native of New Guinea.

Genus, *Myrmecobius*[1].

Myrmecobius. WATERHOUSE, Proceedings of the Zoological Society for July, 1836.—Transactions of the Zoological Society, vol. ii. Pt. 2, p. 149.

Teeth small and detached: incisors, $\frac{4-4}{3-3}$; canines, $\frac{1-1}{1-1}$; molars, $\frac{8-8}{9-9} = 52$. The molar teeth provided with prickly points.

Head somewhat depressed above; the muzzle moderately elongated; muffle naked; nostrils lateral: ears of moderate size, and pointed: tongue very long and slender: bony palate very long, and destitute of the ordinary large palatine openings.

Legs rather short and strong; fore feet naked beneath; provided with five toes, having compressed and curved claws: hind feet naked beneath, in front, and along the mesial line behind; provided with four toes having compressed and curved nails.

Tail long and bushy.

The female destitute of pouch, and having, apparently, eight mammæ, arranged in a circle.

The only known species of the genus Myrmecobius is found on the west coast of Australia, chiefly in the Swan River district, but has likewise been met with as far southwards as the Murray Scrubs. One of its most remarkable peculiarities consists in the great number of its teeth, these being at the same time, many of them, of complicated structure[2]. The incisor teeth are arranged

[1] From μύρμηξ, ant; and βιος, life.

[2] In the Porpoises and Armadillos the teeth are often very numerous, but in these animals they are of a very simple form, and cannot by any difference of structure be divided into canines, false and true molars, &c. It has appeared to me probable that the simple teeth in question represent parts only of the more complicated teeth of other mammals.

laterally, rather small, compressed, and pointed, and slightly recurved at the apex: the foremost two incisors of the lower jaw are distinctly the largest, and incline forwards, but are somewhat recurved at the point. Narrow spaces separate all the incisors of either jaw. The canines, although but moderately developed, are the largest of the dental series: they are compressed, rather wide in the antero-posterior direction, and slightly recurved at the apex. The foremost three molar teeth on either side of each jaw present the most common form of premolars in insectivorous or carnivorous mammals; compressed, pointed, and having a small anterior and posterior lobe, which lobes are very distinct in the hindermost of the teeth in question, and almost obliterated in the foremost, which is the largest of the three. The fourth molar of the upper jaw is very small and compressed, and its crown is divided by notches into four small tubercles; the following four molars present each five or six small prickly points, the number of which differs in the corresponding teeth of opposite sides of the jaw; but it is important to notice that these four teeth differ from the molars which precede them, in having a double instead of a single row of tubercles: this difference of structure induces me to believe, that the more complicated four posterior teeth are true molars, that the small fifth molar corresponds to the principal premolar, and that the three foremost molars are premolars; that, in fact, the unusual number of the molar teeth is due to the presence of extra premolars. But if we are guided by the same kind of differences in the structure of the molars of the lower jaw, we find four premolars and five true molars. The premolars are of the same form as those of the upper jaw, and the true molars differ only in having the inner range of tubercles more developed. The ramus of the lower jaw is so twisted, that the true molars are directed inwards.

MYRMECOBIUS FASCIATUS.

The Banded Myrmecobius.

(*Plate* 14, fig. 1.)

Myrmecobius fasciatus. WATERHOUSE, Proceedings of the Zoological Society for July, 1836, Part iv. p. 69; Transactions of the Zoological Society, Vol. ii. Part ii. p. 149, Plates 27 and 28; Naturalists' Library (Marsupialia), Vol. xi. p. 145, Plate 11.
" " GOULD, Mammals of Australia, Part i. Pl. 10.
" *fasciatus* and *Diemenensis.* GRAY, List of the Mammalia in the British Museum (1843), p. 100.

Fur harsh and somewhat adpressed; of a bright rusty red colour, and pencilled with white, but almost black on the hinder parts of the body, and yellowish white on the under parts: numerous transverse, white, or cream-coloured bands cross the back; are distinct on the hinder parts, but become indistinct, and are interrupted, as they approach the shoulders. A black mark runs along the side of the muzzle, and, passing through the eye, terminates near the ear, which latter is rather small, pointed, and well clothed with small hairs, which are almost entirely black on the outer surface, and of a rusty yellow hue on the inner: feet of a pale rust colour. The long hairs of the tail are chiefly black at the basal half, and yellow-white at the terminal half; but the mesial line of the tail is of a bright rust colour on the under surface.

Inhabits Western and Southern Australia.

The Banded Myrmecobius was first discovered by Lieut. Dale, who procured a specimen whilst on an exploring expedition into the interior of the Swan River settlement, about ninety miles to the south-east of the mouth of the river.

Two specimens of this very elegant little animal were seen by Lieut. Dale, both of which fled to hollow trees for shelter upon being pursued. The district in which they were found abounded in decayed trees and ant-hills; and from some peculiarities in the dentition of the animal, combined with its extremely long and slender tongue, the author, when the animal was placed in his hands by the discoverer, to be described, felt certain that its food was not only insects, but consisted of the softer and smaller species, for procuring which, by scratching up the earth, the strong fore feet and claws appeared to be adapted. Indeed, the peculiarities of structure, combined with the fact that the animal was found in the vicinity of ant-hills, suggested that its food in all probability consisted chiefly of ants—and hence the generic name. As yet, however, we have no direct evidence that ants form the chief food of the *Myrmecobius*, though it is stated in Mr. Gould's "Mammals of Australia," that wherever this animal takes up its abode, there ants are found to be very abundant. In the same work the following particulars of the habits of our animal are given, from the pen of Mr. Gilbert:—

"I have seen a good deal of this beautiful little animal. It appears very much like a squirrel when running on the ground, which it does in successive leaps, with its tail a little elevated; every now and then raising its body, and resting on its hind feet. When alarmed it generally takes to a dead tree lying on the ground, and before entering the hollow invariably raises itself on its hind feet, to ascertain the reality of approaching danger. In this kind of retreat it is easily captured, and when caught, is so harmless and tame, as scarcely to make any resistance, and never attempts to bite. When it has no chance of escaping from its place of refuge it utters a sort of half smothered grunt, apparently produced by a succession of hard breathings.

is much less bright. I have before me a drawing, kindly sent me by Mr. Neill, of a specimen found by that gentlemen at King's George's Sound, in which the whole of the upper parts of the body are much darker than usual. The specimen (a female) was regarded by Mr. Neill as "evidently a variety of the Myrmecobius." This gentleman particularly notices the great length of the tongue of the animal, and the same peculiarity struck Lieut. Dale.

	FEMALE.	
	Inches.	Lines.
Length from tip of nose to root of tail ...	12	0
" from nose to ear	2	6
" of ear		10½
" of tail		7*
" of tarsus and nails	2	1½
" of hind foot and nails	1	3

The skull of the Myrmecobius is of a depressed conical form. Viewing it from above, the most striking points are the almost total absence of crests or muscular ridges; the greatly developed supra-orbital ridge, which is deeply notched in the middle, and sends outwards a large post-orbital process, which is separated but by a narrow space from a corresponding, though smaller, process of the malar bone: the great extent of the lachrymal bones is also striking. The nasal bones are by no means long; narrow in front, and greatly expanded behind; the frontal bones are broad. A semicircular and divided interparietal bone is observable on the hinder part of the skull; the squamous bone is small: the malar bone is broad, being much expanded under the eye, where it inclines outwards, so as to approach to the horizontal; it enters slightly into the composition of the glenoid cavity. The palate is of great extent, especially in the longitudinal direction, and reminds us of the palate of the true ant-eaters. There are no perforations in the palatine bone; the palatine portion of the superior

* The length of the tail, *including* the hair, is about 1¾ inches more than the above.

maxillaries presents two longitudinal ridges, and on the fore part are some oblique ridges, near which some minute perforations for small vessels are observable, as in the Armadillos; and, besides these, there are four very minute openings near the palatine bone. The incisive openings are small, being scarcely one line in length. The auditory bullæ are of moderate size, very convex (almost spherical), and formed by an expansion of the sphenoid alæ. The occipital opening is large, and notched above. All the sutures of the cranium are distinct.

The horizontal rami of the lower jaw are long, and rather slender; the coronoid process is moderately elevated; the condyloid is much elevated; its articular surface is nearly flat, transverse, and approaches to a semicircular form: the angle is slender, by no means long, and is less suddenly bent inwards than is usual in the Marsupialia. The two rami are but loosely joined at the *symphysis menti*

Of *Vertebræ*, there are—cervical, 7; dorsal, 13; lumbar, 6; sacral, 4; and caudal, 23, or perhaps 24. The ring of the atlas is complete beneath—that is to say, the body is anchylosed to the neural arch, and not separate, as in many Marsupialia. The remaining cervical vertebræ present no characters that need arrest our attention: they all have small spinous processes; that of the vertebra dentata is of great antero-posterior extent, though but little elevated. The dorsal vertebræ have moderately elevated spinous processes: the ribs are slender; the clavicle tolerably strong. The sternum is composed of six bones, of which the foremost, or manubrium sterni, is suddenly dilated rather in front of the middle. The lumbar, as well as the four or five first caudal vertebræ, have a small perforation traversing the body from beneath, which has two outlets on the upper surface: the lumbar vertebræ have the transverse processes greatly developed; the corresponding processes of the four or five first caudal vertebræ are also large, being much expanded from before backwards. The scapula has the spine much elevated; in front it is suddenly bent over the infra-spinal fossa, and this reflected portion of the spine is much dilated in the

middle[1]. The humerus is rather short, and powerful—shorter, and with the muscular ridges more developed, than in *Didelphys:* the deltoid ridge is very prominent, projecting boldly about midway between the extremities of the humerus: the internal condyle is perforated.

With respect to the remaining portions of the skeleton I shall only observe, that the ulna and radius are nearly in contact for their whole length, as in the Dasyures, and the same remark applies to the tibia and fibula. The metatarsal bone of the thumb is exceedingly short, and supports but one phalanx, which is very small, and is so enclosed in the integument, in the living animal, as not to project in the form of a free point.

In the mounted skeleton of a Myrmecobius in the College of Surgeons, the inner toe or thumb of the fore foot has three phalanges[2].

Genus, *Phascogale*[3].

Phascogale. Temminck, Monographies de Mammalogie, tom. i. p. 56. 1827.

Dasyuridæ with the two foremost incisors of the upper and lower jaw larger than the others; premolars $\frac{3-3}{3-3}$, true molars $\frac{4-4}{4-4}$, studded with prickly tubercles; those of the upper jaw with triangular crowns; the last tooth very narrow, and transverse. Five toes to the fore, and the same number to the hind feet; the inner toe of the latter in the form of a small,

[1] It nearly resembles the scapula of a Didelphys, but is proportionately shorter, and has the spine much more developed.

[2] In a foot of a bear in the same museum, I find three phalanges to the inner toe, and M. De Blainville represents three to the inner toes of the fore and hind foot of *Ursus ferox.* I have never seen any other instance amongst the Mammalia in which the thumb has more than two phalanges.

[3] From θάσκωλος, a pouch; and γαλῆ, a weasel. *Phascologale* would have been a more correct compound.

nailless, prehensile thumb. Tail either clothed with short hair throughout, or with short hairs only on the basal portion, the apical having long and bushy hair. The females sometimes destitute of pouch; mammæ eight, arranged in a circle.

The differences which present themselves upon comparing the skulls of these small *Dasyuridæ* with those of the larger species of the family, are of the same nature as those to which I called attention at p. 308, when comparing the smaller Phalangers with the larger. In addition to the comparatively large size of the cranial cavity, and of the occipital opening, and the very slight indications of muscular ridges in the skulls of the Phascogales, I may notice that the spinous processes of the cervical vertebræ in their development follow very closely that of the muscular ridges of the skull.

The two foremost incisor teeth of the upper jaw are slightly separated from the rest; the remaining three on either side are closely packed: the canine teeth are tolerably well developed: the premolars are compressed and pointed, and, viewed from the outer side, present nearly a triangular figure; the two foremost have a small anterior and posterior tubercle; in the third, a posterior small basal tubercle only remains. The molars, which, together with the premolars, form a continuous series, have the masticating surface of a triangular form; they each have three external cusps, two in the mesial line of the tooth, and one internal lobe, if we except the last, which has but two external cusps, one mesial, and one internal tubercle. The true molar teeth of the lower jaw have each three principal cusps, two placed on the inner side of the tooth, and one on the outer side; and besides these there is a posterior lobe, which is more or less distinctly divided by a notch into two tubercles; these are, however, but little elevated.

The muzzle is pointed, and but little elongated; the muffle is naked, and the nostrils are lateral. The ears are of moderate size, broadest at the base, and have the hinder edge emarginated, or nearly straight. The limbs are short; the fore feet are provided with five well developed toes, having compressed, curved, and pointed claws: four of the toes of the hind feet have similar claws, but the toe corresponding to the thumb is nailless.

The Phascogales are insectivorous mammals, and climb trees and shrubs in quest of their prey. The largest known species is about equal in bulk to the Common Rat, and most of the species are considerably smaller than that animal.

Within the last four or five years the described species of the present section have increased from two, which have long been known, to about a dozen, and some trivial differences observed among these have given rise to the establishment of new genera; as sections of minor value only can we adopt them.

The dentition of the Phascogales presents some modifications in the different species which are worthy of notice: thus, in ***P. penicillata***, ***P. calura***, and ***P. apicalis***, the third premolar of the lower jaw is very much smaller than the preceding two premolars, but the last mentioned of these three species differs from ***P. penicillata*** and ***P. calura*** in having the third premolar of the upper jaw also very small, the corresponding tooth being distinctly the largest of the premolars in those animals. *P. penicillata* and *P. calura* differ from all other species, in having the foremost of the three lateral incisors of the upper jaw the largest: in other Phascogales they are of equal size, or perhaps in some it may be said to be smaller than the others: in ***P. albipes*** and ***P. crassicaudata*** the tooth in question is rather smaller than the other incisors. The lateral upper incisors in all the Phascogales are vertical, whilst the anterior pair, which are larger, are directed forwards.

In *P. Swainsonii*, *P. flavipes*[1], and *P. leucogaster*, the third is the largest of the premolars in the upper jaw, and is rather smaller than the preceding two, in the lower jaw. *P. leucopus*, *P. albipes*, and *P. crassicaudata*, differ from the above only in having the second and third premolars of the lower jaw equal.

With regard to the true molars, those of the upper jaw differ from the true molars of the Marsupial animals already described, in having the crown of a triangular form, a form of the masticating surface in these teeth which runs through the remaining species of the order. In the herbivorous species we have found the crowns of the true molars approaching more or less to a square form, and the same form was found in some of the insectivorous species forming the genus *Perameles*; in other members of that genus, however, owing to the reduced size of the posterior internal lobe, the masticating surface of the molars approximated to the triangular form. Now if we compare the true molar teeth of Phascogale with these species of Perameles, we shall find that the chief difference consists in the absence of the posterior internal lobe in the Phascogale. Another point of distinction in the molar teeth of the two animals is observable in the number of prickly tubercles arranged along the outer side of the tooth, there being four in Perameles, and but three in Phascogale: it is the foremost of the four, in Perameles (which is the smallest), which is lost in Phascogale, or of which there remains only an indistinct trace[2].

[1] In the immature animal, when the skull presents but three true molars on either side of the jaws, the third, or hindermost, of the upper and lower premolars is a minute tooth in *P. flavipes*, and probably in other species; it is then a milk tooth, and therefore to be replaced by another.

[2] In the true molar teeth of the species of Perameles I find very evenly developed all the cusps, or pointed tubercles, which are found in Insectivorous

Section I. *Phascogale* proper.

Phascogales having the terminal half of the tail clothed with very long and bushy hair.

This section necessarily contains the *Phascogale penicillata*, that being the animal upon which M. Temminck founded the genus. A second species of Bushy-tailed Phascogales has recently been added to our lists by Mr. Gould.

Mammalia: their structure can scarcely be said to differ from that observable in the true molar teeth of the genus *Tupaia*, in the order Insectivora.

The dentition of Phascogale is very interesting, as showing an intermediate condition between what may be called the insectivorous and carnivorous types of dentition, and since it enables us to ascertain what parts are wanting in the more simple carnivorous molar tooth, where we find the remaining parts have a proportionate increase in their development—that such is the case may be clearly seen upon comparing the true molars of the *Perameles obesula* with those of a Phascogale. A transverse indentation divides the molar of the Perameles into two equal parts, and the structure of one of these is a repetition of the other, each part presenting an elevated triangular area externally, the angles of which are marked by three prickly tubercles; and an internal, less elevated lobe. The same transverse indentation exists in the molar of the Phascogale, and the same raised triangular area is found to each half, but the hinder half wants the internal lobe; here the triangular area is more developed, whilst on the anterior half of the tooth, where the inner lobe is larger than in Perameles, the corresponding area is proportionately small, and the foremost of the four outer tubercles of the tooth of the Perameles, belonging to the area in question, is obliterated. *The true molar teeth of the lower jaw*, when compared with those of *Perameles*, present corresponding differences—they have the anterior half (which presents three much elevated prickly cusps) more developed than in Perameles, and this increase of development is, as it were, at the expense of the hinder half of the tooth, which is proportionately small.

PHASCOGALE PENICILLATA.

Brush-tailed Phascogale.

The *Tapoa Tafa*, or *Tapha*.	WHITE'S Journal of a Voyage to New South Wales, p. 281, and Pl.
Didelphis penicillata.	SHAW, General Zool., i. Pt. 2, p. 502, Tab. 113, fig. 1.
Dasyurus penicillatus.	GEOFF. Ann. du Mus. iii. p. 361.
" *Tafa.*	GEOFF., loc. cit. p. 360.
Phascogale penicillata.	TEMMINCK, Monographies de Mammalogie, tom. i. p. 58, Skull Pl. 7, figs. 9—12.
" "	GOULD, Mammals of Australia, Part 1, Pl. 6.

Fur long, and moderately soft; grey, pencilled with white; under parts white; feet grey, toes whitish; ears large, clothed with minute dusky hairs; mesial portion of head dusky; tail bushy, having long black hairs, excepting on the basal third, where the hairs are short, adpressed, and of a grey hue, but black, or dusky on the under side.

Inhabits New South Wales, South Australia, and Western Australia.

This pretty little animal was first noticed in White's Journal, above quoted, but being there mentioned with the same name, Tapoa Tafa, as *Dasyurus viverrinus*, the two species were confounded together by Shaw, in his account of the last mentioned animal, though he nevertheless characterises the present species in another part of his work, under the specific name *penicillata*, a name still used. Geoffroy Saint-Hilaire perceived that the two animals, confounded by Shaw under the name *Didelphys viverrinus*, were distinct, and proposed for the present animal the name *Dasyurus Tafa*, but he did not suspect that his *D. Tafa* was identical with the *D. penicillatus*, a fact which we have ascertained by an examination

of White's specimen still preserved in the Royal College of Surgeons. The Brush-tailed Phascogale is nearly equal in size to the Common Squirrel (*Sciurus vulgaris*); has a long, and moderately soft fur, which, on the upper parts of the head and body, is of a grey colour, and on the under parts, white, or yellow-white. The eyes are encircled with black, and there is a pale spot both above and below the eye: along the middle portion of the head, the hairs are more suffused with black than elsewhere: on the back, the hairs are finely annulated with whitish near the point, and are black at the point, whilst they are of a deep grey colour at the root. The ears are sparingly clothed with small pale hairs internally and externally, but on the fore part of the outer surface they are dusky. The fore legs and feet are of a pale greyish brown colour; the toes almost white; the hind feet are somewhat dusky behind, but pale in front, and the toes are grey-white. The tail is about equal to the body in length; at the root, covered with fur like that of the body; there is then a portion of about two inches in length which is clothed with short stiff hairs, which are of a very pale grey hue (sometimes chiefly yellowish white), but dusky along the middle line beneath; and the remaining portion, being about two-thirds of the whole, is clothed with very long and glossy black hairs, varying from one to two inches in length.

	Inches.	Lines.	Inches.	Lines.
Length from nose to root of tail ...	9	0	9	6
" of tail	7	0*	7	6
" from nose to ear	1	9	1	11
" of ear		10		11
" of tarsus	1	6¾	1	7

The present species has an unusually wide range, being found in New South Wales, and both in Southern and

* About 8½ inches, *including* the long hairs.

Western Australia. It climbs trees in quest of its insect food, and makes its nest in the hollows of the trunks or branches. Mr. Gould states that it enters the stores of the settlers, and that it is accused of attacking their poultry.

PHASCOGALE CALURA.

Handsome-tailed Phascogale.

(*Plate* 14, fig. 2.)

Phascogale calura — Handsome-tailed Phascogale. GOULD, Mammals of Australia, Pt. 1, Pl. 7. Proceedings of the Zoological Society for June, 1844, p. 104.

General colour of the upper parts of the body ashy grey ; of under parts yellowish white : tail at the base with short bright rust coloured hairs ; the apical half with long black hairs.

Inhabits Western Australia.

A beautiful species, discovered by Mr. Gilbert, at Williams' River, Western Australia. Like the *P. penicillata* it has the apical portion of the tail clothed with long black hairs, but it may be distinguished from that animal by its smaller size, and the brilliant rust colour of the basal part of the tail; the black hairs on the remaining portion, moreover, although long, are by no means so long as in *P. penicillata*. The skull, which has been removed from the specimen described by Mr. Gould, and which is now in the British Museum, has all the teeth developed, and its much smaller size, combined with some differences of proportion when compared with that of *P. penicillata*, leave no doubt on my mind as to the distinctness of the two species. The prevailing colour of the

P. calura is ashy grey; the body beneath is white, slightly suffused with yellow, and a delicate yellow tint is observable on the sides of the body. In front of the eye is a black patch, and a whitish spot is situated immediately beneath the eye. The ears are rather sparingly clothed with minute hairs, which are of a yellowish white colour on the inner sides, excepting on the anterior margin, where they are black, and brownish on the outer surface. The feet are of a greyish white hue. The apical half of the tail is densely clothed with glossy black hairs, averaging about half an inch in length, or rather more, and the basal half is covered with short adpressed hairs, which are of a brilliant rust colour, excepting along the mesial line beneath, where, almost to the root of the tail, they are black.

	Male.	
	Inches.	Lines.
Length from tip of nose to root of tail ...	5	3
" of tail	5	2
" of ear		8½
" from nose to ear	1	2
" of hind foot and nails		11

Section 2. *Antechinus.*

Antechinus. MacLeay, Annals, and Magazine of Natural History, for December, 1841, vol. viii. p. 242, and for January, 1842, vol. viii. p. 338.

" Gray, List of the Mammalia in the collection of the British Museum (1843), p. 99.

Phascogales in which the tail is clothed throughout with very short hairs.

With respect to the animal to which the generic title *Antechinus* was given by Mr. MacLeay, that gentleman observes that it differs from Phascogale in having the three lateral

incisors of the upper jaw of equal size, and also in having all the premolars equal[1]. We have already pointed out the differences observable in the dentition in the different species of the genus Phascogale (in which I include *Antechinus*), and it is only necessary here to observe, that all the species which we, following Mr. Gray, place in the present section, do not precisely agree amongst each other in their dentition.

PHASCOGALE (*Antechinus*) SWAINSONII.

Swainson's Phascogale.

Phascogale Swainsonii. Waterhouse, Mag. Nat. Hist. for 1840, vol. iv. p. 300.

Above deep brown, very finely pencilled with rusty brown; beneath grey, obscurely tinted with yellow: tail and feet dusky brown.

This species inhabits Van Diemen's Land, and ranks in size next to the Brush-tailed Phascogales, being larger than most of the species of the present section. Its colouring is much darker than other hitherto discovered species, and is almost destitute of any grey hue. The fur is long, and moderately soft, and is of a deep grey colour next the skin: on the back the hairs are most of them narrowly annulated with rusty yellow, or brownish rust colour, the deeper tint being observable on the hinder parts. The hairs of the under parts of the body are grey, but tipped with yellowish. The tail is clothed throughout with small adpressed hairs of a dusky brown colour, and a trifle paler on the under than on

[1] Annals of Nat. Hist., vol. viii. p. 338.

the upper surface. The feet are uniform dusky brown: the fleshy pads on their under surface are transversely striated, and the remaining naked portion of each foot is apparently smooth. The muzzle is narrower, and more elongated than usual. The specimen from which the original description was drawn up, measured, from the tip of the nose to the root of the tail, five inches and two lines in length, and its tail was three inches and five lines long; the animal, however, attains a larger size, as will be perceived from the following dimensions, taken from a specimen, from Tasman's Peninsula, in the collection of the British Museum:—

	Inches.	Lines.
Length from tip of nose to root of tail	7	0
" of tail	4	0
" of tarsus		11¾
" of ear		4
" from tip of nose to ear	1	4

Mr. Gould imagined this species was identical with the *Dasyurus minimus* of Geoffroy; I have recently compared the two animals together, and find this is not the case.

The skull of *P. Swainsonii* is proportionately narrower, and more elongated, than in other species of its genus, and its upper surface is remarkably flat; the interorbital space is broad; the anterior upper pair of incisors are smaller, and are in contact with the others, not being directed outwards and forwards as in other Phascogales, or at least very slightly so: a space on either side of the foremost upper premolar separates this tooth from the canine, or from the second premolar. The third upper premolar is about equal in size to the second: the corresponding tooth in the lower jaw is smaller than the second lower premolar. The incisive openings of the palate are much larger than usual, extending backwards so as to terminate opposite the second premolar.

PHASCOGALE (*Antechinus*) APICALIS.

Freckled Phascogale.

Phascogale apicalis. GRAY, Annals and Magazine of Natural History, vol. ix. p. 518. 1842.

Antechinus apicalis. GRAY, List of the Mammalia in the British Museum, 1843, p. 99.

" " Freckled Antechinus. GOULD, Mammals of Australia, Pt. 1, Pl. 11.

General colour grey-brown—of a very rich brown hue on the hinder parts of the body; on the head and fore parts of the body distinctly freckled with black and white; under parts dirty yellow-white; fore legs of a bright rust colour; hind legs less distinctly tinted externally with the same colour: tail clothed at the root with hairs like those on the body, but with the hairs becoming gradually shorter towards the apex, where they are black.

Inhabits Western Australia.

This species is found in the Swan River district, and at King George's Sound, and, indeed, appears to be pretty generally distributed over Western Australia. Mr. Neill informs me that it is called the "Dibbler" at King George's Sound, and I perceive, upon consulting Mr. Gould's beautiful work, that that gentleman has received it from the same district with the name just mentioned. Mr. Gilbert, in his notes, quoted by Mr. Gould, states that he found insect remains in the stomachs of specimens which he dissected, and that, while at King George's Sound, he obtained a female specimen having seven young attached; they were little more

than half an inch in length, quite naked, and blind. "Above the mammæ of the mother, observes Mr. Gilbert, is a very small fold of skin, from which the long hairs of the under surface spread downwards, and effectually cover and protect the young. This fold in the skin of the abdomen is the only approximation to a pouch which I have found in any of the members of this genus. The young are very tenacious of life: those above mentioned lived nearly two days attached to the mammæ of the dead mother.

The black hairs of the end of the tail form a small pencil or tuft; hence the name *apicalis* was applied to this species, but the tail can scarcely be said to differ in this respect from other species of the Antechinus section; the basal part of the tail, however, is clothed with longer hairs than usual. The English name given by Mr. Gould I have adopted as calling attention to a striking characteristic of the *P. apicalis*, when compared with other Phascogales, viz. its freckled appearance. On the back the hairs are of a very dark grey at the root; each hair is of a yellowish brown colour in the middle, annulated with white or rusty white below the point, and black at the point: on the hinder part of the back the white is replaced by rusty yellow, and hence the general tint is here darker and richer. On the under parts of the body the hairs are yellowish white, but faintly tinted with grey at the root. The ears are rather small, and tolerably well clothed, and the hairs are for the most part black and yellowish. The fore legs are always suffused with rust colour externally—usually very bright: the hind legs are also tinted with rust colour, but less distinctly than the anterior limbs. The feet are of a dirty yellowish white colour: the whole sole of the foot is covered with small but distinct tubercles, with the exception of the larger fleshy pads, which are in part transversely striated, and the under

sides of the toes, which present numerous strong transverse incisions.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	6	0	6	8
" of tail	3	2	4	0
" from nose to ear	1	4	1	6
" of ear		$4\frac{1}{3}$		5
Width of ditto		6		
Length of hind foot and nails ...		$11\frac{1}{2}$	1	0

The dimensions in the first column are from a female specimen in the British Museum; those in the second, are from a very large male in Mr. Gould's collection.

PHASCOGALE (*Antechinus*) FLAVIPES.

Yellow-footed Phascogale.

Phascogale flavipes.	WATERHOUSE, Proc. Zool. Soc. for 1837, p. 75.
" *rufogaster.*	GRAY, App. Grey's Journal, p. 407.
Antechinus flavipes.	GRAY, List of the Mammalia in the British Museum, 1843, p. 99.
? *Antechinus Stuartii.*	MACLEAY, Annals and Mag. Nat. Hist., vol. viii. p. 242, and p. 338.

General colour of upper parts grey, but on hinder parts of back tinted with fulvous; sides of body washed, as it were, with bright rusty yellow, or with rust colour; feet, and under parts of body, bright rust colour, or rusty yellow; chin, throat, and chest, whitish: tail black; freckled with yellow towards the base above; under parts, at base, rusty yellow.

Inhabits New South Wales and South Australia.

The fur of *P. flavipes* is moderately long, and soft, of a deep grey colour next the skin, but blackish, and, for the

most part, freckled with yellow externally; that on the belly is usually of a brilliant yellow-rust tint, but is sometimes palish ochreous, and the colour of the feet is the same in either case. The tail is clothed throughout with short hairs, but at the point they are a trifle longer, and form a small tuft.

	Inches.	Lines.
Length from tip of nose to root of tail ...	5	4
" of tail	3	2
" from nose to ear	1	1½
" of ear		5½
" of tarsus		9½

The fleshy pads on the under surface of the feet are transversely striated; the outer tarsal pad is very long, extending from the base of the inner toe, or thumb, to the proximal extremity of the metatarsal bones: the remaining naked portions of the foot are apparently smooth, or very indistinctly tuberculated. The skull is rather short, and broad, and very flat above; the palate presents two short incisive foramina, and two posterior palatal openings situated opposite the penultimate and antepenultimate molar teeth. Its dimensions are given hereafter.

Antechinus Stuartii. MacLeay.

Under the above generic and specific names Mr. W. S. MacLeay characterises an animal, obtained at Spring Cove, near Sydney, which, I strongly suspect, will prove to be the *Phascogale flavipes;* the very short specific description given by Mr. MacLeay, however, does not enable me to satisfy myself upon this point. The animal is said to be of a fulvous colour, but having the limbs, internally, and the abdomen whitish: the tail nearly equal to the body in length; and the whole length of the animal, to the tip of the tail, 9½ inches.

Mr. MacLeay's original description appeared in the Annals and Magazine of Natural History for December, 1841, (vol. viii. p. 242), and is drawn up from a figure selected from a number of drawings made by Mr. Stuart (a surgeon in the army), combined with some notes by the same gentleman. From these it appeared the animal agreed with *Phascogale* generally, but was remarkable for the possession of but six incisors in the upper jaw, and thus afforded an exception to the dental formula of other carnivorous or insectivorous Marsupialia. Subsequently, however, Mr. MacLeay had an opportunity of examining the skeleton of the animal in question, and discovered the true dental formula to be as in *Phascogale*[1]. The animal, however, differs, Mr. MacLeay observes, "in the three lateral incisors of the upper jaw being of equal size, and also in the pseudomolars being all of equal size."

PHASCOGALE (*Antechinus*) LEUCOGASTER.

White-bellied Phascogale.

Phascogale leucogaster. GRAY, Append. Grey's Journal, p. 407.
Antechinus leucogaster. GRAY, in List of the Mammalia in the collection of the British Museum, 1843, p.

Grey; hinder part of back tinted with rusty brown: under parts white: feet dusky white; tail dusky above and beneath, but blackish at the apex; ears rather large, and sparingly clothed, for the most part, with minute pale hairs.

This animal so greatly resembles the *Phascogale flavipes* in its proportions, as well as in the structure of its skull and teeth, that it is with considerable hesitation I describe it as

[1] See Annals and Mag. Nat. Hist. for January, 1842, vol. viii. p. 338.

a distinct species. I have seen, however, several specimens from Western Australia which agree perfectly with the individual from which Mr. Gray drew up his original description, and differ from the *P. flavipes* in having the under parts of the body white, and in having little or no rusty yellow on the sides of the body, and on the feet. The general tint of the upper parts of the body likewise differs somewhat, being less grey: on the fore parts of the body it is brownish grey, and on the hinder parts rich brown. The feet are brownish white; not unfrequently suffused with brown behind. The tail is brown above, pale-brown beneath, and dusky towards the point.

A skull, removed from a specimen sent me from King George's Sound by Mr. Neill, differs from a skull of *P. flavipes* in the British Museum collection, in having the muzzle (and consequently the nasal bones) a trifle shorter, but the difference is not more than is often found in individuals of the same species, and I think it by no means improbable that the *P. leucogaster* is a local variety of *P. flavipes*.

	Ins. Lines*	Ins. Lines†	Ins. Lines‡
Length from tip of nose to root of tail ...	4 5	4 9	4 6
" of tail	2 10	3 2	3 2
" from nose to ear	11½	11½	11
" of ear	5	5	5
" of hind foot and nails	8	9	9½

* From specimen in the British Museum, from the neighbourhood of the Canning River, Western Australia.

† From specimen in the same collection from Victoria Plains.

‡ From a male specimen found at King George's Sound, and presented to the author by Mr. Neill.

PHASCOGALE (*Antechinus*) MINIMA.

Geoffroy's Phascogale.

Dasyurus minimus. GEOFFROY, Annales du Muséum, tom. iii. p. 362.
" " SCHREBER, Saugth. Suppl. Tab. 152, B. e.
Phascogale minima. TEMMINCK, Monographies de Mammalogie, tom. i. p. 59.
" *affinis.* GRAY, Appendix to Grey's Journal of Two Expeditions of Discovery in Australia, vol. ii. p. 406.

Brown, suffused with rusty yellow, the latter tint very distinct on the hinder parts of the body; under parts palish buff-yellow, as well as the feet, inner surface of the ears, and tail beneath; upper surface of the tail dusky brown.

Inhabits Tasmania.

The fur of this animal is long, and moderately soft; the hairs of the back are grey, broadly ringed with rich rusty yellow near the point, and dusky at the point; the longer interspersed hairs have the visible portion black; the general tint produced by this admixture of colours is rich yellowish brown; a brown hue prevails on the upper surface of the head, and the hinder part of the body is of a very deep reddish yellow tint: on the under parts of the body the hairs are grey at the base, and of a palish buff-yellow externally. The ears are small, and have the hinder margin nearly straight; they are densely clothed with minute yellowish hairs, both internally and externally. The tail is about as long as the body, well clothed with short hairs, of a dusky brown colour on the upper surface, but of a dirty yellow hue on the sides and under surface. The feet are very nearly of the same tint; the claws of the fore feet are rather long.

	Inches.	Lines.
Length from tip of nose to root of tail ...	3	10
" of tail	2	6
" from nose to ear		10¼
" of ear		2¾
" of fore foot and claws		5¾
" of claw of middle toe		1¾
" of hind foot and claws		9⅓

Formerly I was led, upon Mr. Gould's authority, to link together, as names of the same species, *Phascogale Swainsonii* and *P. minima*; having since, however, had reason to doubt the accuracy of this identification, I took with me to Paris the animal to which I had given the name *Swainsonii*, and compared it with Geoffroy's *Dasyurus minimus*. I found the two animals to be very distinct, and that the latter was a species exceedingly close to, if not identical with, either the *Phas. flavipes* or the *P. affinis*. From *P. flavipes* it appeared to me to differ in having the ears proportionately smaller, and the claws of the feet rather larger; and this I find, upon comparing dimensions, to be actually the case, and I also find that these differences distinguish the *P. affinis* from *P. flavipes*. In fact, I can discover no points of distinction between the *Dasyurus minimus* of Geoffroy and the *Phascogale affinis*, excepting that the former is of smaller size, and has the fur differently coloured; and when we bear in mind that the little animal described by Geoffroy has been exposed to the action of light in a museum for upwards of forty years, we cannot but suppose its colouring has changed. The difference of size, I need scarcely say, may arise from difference of age in the specimens when captured, and hence it does not appear that we have good grounds for separating, as distinct species, these two animals, which may have been found within about five miles of the same spot, the one being from Tasman's Peninsula, and the other from Maria Island. The

following description is from the animal found in Tasman's Peninsula.

Phascogale affinis. GRAY.

Fur long, and moderately soft; on the head and fore part of the back, brownish grey, slightly tinted with yellow; on the hinder parts of the body, of a deep fulvous brown, and on the under parts of a very pale yellowish hue. The feet are of a dusky brown colour, and so is the upper surface of the tail, but near the base it is somewhat pencilled with yellow. The ears are clothed with small hairs, which are for the most part yellowish. The fur, both on the upper and under parts of the body, is of a deep slate-grey colour next the skin; the hairs of the back are annulated with yellowish towards the point, and black at the point; or, on the hinder parts of the back, the yellow is replaced by a rich brown colour.

	Inches.	Lines.
Length from tip of nose to root of tail ...	5	6
" of tail	2	10
" from nose to ear	1	3
" of ear		4
" of hind foot and nails		10

PHASCOGALE (*Antechinus*) ALBIPES.

The White-footed Phascogale.

Phascogale albipes. **WATERHOUSE, Proceedings of the Zoological Society for March, 1842, Pt. 10, p. 48.**

Fur moderate as to length, and very soft; on the upper parts of the body brownish grey, and on the under parts white. Tail dirty white beneath, and of a dusky ash colour above. Feet

white, slender, and with the naked portions entirely covered with minute tubercles. Ears large.

Inhabits South Australia (Western Australia and Van Diemen's Land ?)

The White-footed Phascogale was discovered by the late J. B. Harvey, Esq., a very zealous corresponding Member of the Zoological Society, who for many years exerted himself in collecting specimens to enrich that Society's Museum[1]. In size and colouring this little animal greatly resembles the Field Mouse (*Mus sylvaticus* of authors): its form is less robust than that of any of the Phascogales already described; its feet are more slender, and a greater portion of the palm of the hind foot is clothed with fur. In neither of the preceding species does the hair on the under side of the foot extend beyond the heel; terminating in front at the proximal extremity of the metatarsal bones. In *P. albipes* the hair encroaches on either side of the sole of the foot (and more especially on the outer side), so as to contract the naked portion—most so behind, and gradually less towards the fore part. In all the preceding species, the fleshy pads[2] on the under surface of the foot, at the base of the toes, are transversely or obliquely striated, whilst in the present, and other species about to be described, they are covered with small tubercles, as well as the other naked parts of the foot: on the toes the tubercles are arranged in two longitudinal rows.

[1] Mr. Harvey is also the author of some communications printed in the Zoological Society's publications.

[2] With regard to the pads in question, it will be found that usually in quadrupeds which have five toes to their feet, there are three of these pads, or fleshy tubercles, situated near the base of the four outer toes, and a fourth placed near the root of the inner toe: they are evidently destined to protect the under surface of the toes from pressure, which, by hardening the skin, would impede the motions of those members. Other pads there are on the under side of the foot which serve to protect the blood-vessels. These latter might be called *carpal* or *tarsal pads*, and the former, digital pads.

The fur, both on the upper and under parts of the body, is of a deep slate grey colour next the skin: on the upper parts, the hairs are of a very pale yellow colour near the point, and black at the point; those on the under parts of the body are white at the point. The eyes are encircled with black. The ears, which are large, are clothed throughout with minute hairs, chiefly of a pale hue, but dusky on the outer surface near the anterior margin. The tail is clothed with very small hairs (smaller than in either of the preceding species), and these are of a dirty white colour on the under surface, and partly black and party yellow-white on the upper suface.

	Inches.	Lines.
Length from tip of nose to root of tail ...	3	9
" of tail	3	2
" from nose to ear		10½
" of ear		6
" of tarsus and nails		8½

The skull in *P. albipes* is proportionately narrower, and less depressed, than in *P. flavipes* and its allies, and the palate has an extra pair of openings — they are situated entirely in the palatine bone. The principal palatine openings are situated opposite the first, second, and third true molars.

PHASCOGALE (*Antechinus*) LEUCOPUS.

Tasmanian White-footed Phascogale.

Phascogale leucopus. Gray, Annals and Magazine of Natural History for December, 1842, vol. x. p. 261.

Fur very soft, and rather long: general colour grey, much suffused with black on the back of the animal, and very finely pencilled with pale yellow; the yellow most distinct on

formly white. The tarsi are almost entirely covered with hair on the under side, there being only a very narrow naked space running backwards from the digital pads, which are covered with small tubercles. Two longitudinal rows of small tubercles are observable on the under side of each toe. The fur, both on the upper and under parts of the body, is grey next the skin.

	Inches.	Lines.
Length from tip of nose to root of tail ...	3	3
" of tail	2	10
" of ear		$4\frac{1}{2}$
" of hind foot and nails		$7\frac{3}{4}$

PHASCOGALE (*Antechinus*) MACROURA.

Ash-coloured Phascogale.

Podabrus macrourus. GOULD, Proceedings of the Zoological Society for June, 1845.

Fur moderately long, and soft; on the upper parts of the body ashy grey, somewhat suffused with black on the back and mesial line of the head, on the under parts of the body white, and on the sides of the body tinted with cream-colour: feet white: tail with the basal half much thickened—in the male sex at least; clothed throughout with small hairs, above partly black and partly yellow on the basal portion, but entirely black on the apical portion; beneath dirty white: ears moderately large, clothed with whitish hairs, but dusky on the outer side, in front. Eye encircled with black. The fur on the upper and under parts of the body of a deep grey colour next the skin,

Inhabits New South Wales.

In Mr. Gould's collection are two specimens of this species which appear to me to be decidedly distinct from the *Phasco-*

gale crassicaudata. Like that animal it has the tail incrassated, a character which perhaps may be sexual, or even may not be constant in individuals of the same sex at different periods. Of the two specimens, one is decidedly a male, and this has the tail much incrassated; the other is apparently a female, and here the tail can scarcely be described as incrassated, though it is thicker than in the little slender-footed species, *P. albipes*, &c. From *P. crassicaudata* the present animal may be distinguished by its much larger size, the proportionately greater length of its tail, and its ashy-grey colouring, which presents no admixture of yellow, excepting on the sides of the body, where a delicate cream-coloured band separates the white of the under parts from the grey of the upper. I have assured myself that the difference of size between this species and the *P. crassicaudata* is not dependent upon either a difference of age or sex, having seen adult specimens of both sexes of *P. crassicaudata*, and I have scarcely a doubt that the two specimens of *P. macroura* are of different sexes.

	Male.		Female?	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	4	2	3	11
" of tail	3	3	2	10
" from nose to ear	1	0		11½
" of ear		5		4¾
" of hind foot and nails		8½		7½

In the male specimen the diameter of the tail is between three and four lines, near the base: from the middle it tapers rather suddenly to the apex. In the female the tail is rather more than two lines in diameter at the base.

PHASCOGALE (*Antechinus*) CRASSICAUDATA.

The Thick-tailed Phascogale.

(*Plate* 15, fig. 2.)

Phascogale crassicaudata. GOULD, Proceedings of the Zoological Society for June, 1844, Pt. 12, p. 105.
Podabrus crassicaudatus. GOULD, Mammals of Australia, Pt. 1, Pl. 5.

Fur long, dense, and extremely soft; on the upper parts of the body grey washed with yellow; on the sides of the body of a delicate yellow, and on the under parts white: feet, and under surface of the tail, white: ears large; sparingly clothed with very minute hairs, which are for the most part whitish, but on the outer surface is a large black patch extending inwards from the anterior margin.

Inhabits Western and Southern Australia.

Mr. Gould, in his Mammals of Australia, places this animal under the new generic name *Podabrus*, on account of its having slender and delicate feet, as compared with the *Phascogale flavipes*, and its allies. Whatever may be the value of this new section, it certainly should include, as well as the *P. crassicaudata*, the *P. albipes*, *P. leucopus*, *P. murina*, and *P. macroura* and the last mentioned animal approaches most nearly, in having the tail incrassated, to the present species. All these *Phascogales* have the slender feet, the heel more clothed with hair than in others of the group, and the pads on the under side of the foot covered with minute tubercles, instead of being striated, as represented in the foot of *P. penicillata* (see Pl. 12, fig. 2.)

The fur of the Thick-tailed Phascogale is of a deep lead-grey colour next the skin; on the under parts of the body each hair is white at the point; on the sides, the hairs are of a delicate yellow at the point, and on the back they are

yellow near the point, and black at the extremity. The ears are large, slightly emarginated behind, and somewhat pointed at the apex: the flesh of the ears appears to have been dark in the living animal, but in the middle of each ear is a spot which was apparently of a pale flesh colour. The eye is encircled with black; and in front of that organ the black is considerably extended. The tail is short, and, in the specimen described by Mr. Gould, is about 2½ lines in diameter in the middle: this specimen is a male, and is from William's River, Western Australia. In a second specimen, apparently a female, and which is from South Australia, the tail is scarcely incrassated. Both specimens are in the British Museum collection: the dimensions of the first mentioned of these, were taken by Mr. Gilbert before the animal was skinned, and are—

	Inches.	Lines.
Length from tip of nose to root of tail ...	3	9¾
" of tail	1	9¾
" from nose to ear		10½
" from ditto to eye		6
" of ear		9
" of hind foot and nails		7*

PHASCOGALE (*Antechinus*) MELAS.

New Guinea Phascogale.

Phascogale melas. **Sal. Müller, Verhandelingen over der Naturalijke Geschiedenis der Nederlandsche overzeeschte Berittingen—Zoologie, Tab. 25, figs. 1-3.**

Fur black: ears short, and clothed with small hairs.

Inhabits New Guinea.

* Added from the stuffed specimen.

This animal is said to be of the size of the Black Rat (*Mus Rattus*), and of a nearly uniform black hue: the short and soft fur of the back is rather glossy; on the under parts of the body the fur is of a less pure black colour, assuming a slight rusty hue. The ears, feet, and tail, are clothed with short hairs. The eyes are brown.

According to Dr. Müller's figures, the *P. melas* is about 8 inches in length; its tail 6¼ inches; hind foot and nails 1 inch 5 lines; and the ear half an inch. The portion of the skull represented shows that the nasal bones are rather suddenly expanded behind. The third molar tooth of the upper jaw is represented as rather smaller than the preceding premolars, and the corresponding tooth of the lower jaw is very small, as in *Phascogale calura* and *P. penicillata.*

In the following table I have given the dimensions of the skulls, or parts of skulls, of the different species of Phascogale which I have had an opportunity of examining.

	Phascogale penicillata.		*P. calura.*		*P. Swainsonii.*		*P. apicalis.*		*P. flavipes.*		*P. leucogaster*, MALE. King George's Sound.		*P. albipes.*		*P. leucopus.*		*P. murina.*		*P. crassicaudata.*	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length of skull	1	11	1	2½		*			1	2	1	1½	1	0¾						
Width of ditto	1	1		8½						8½		8¼		7¼						
" between orbits ...		4		3		4		3½		3		3		2⅔		3		2½		
Length of nasal bones		8⅓		4¾		6¼				5½		4¾		5				3⅔		
Width of ditto behind		3½		2		2				2¼		2		1¼				1		
From front of foremost incisor to back of last molar *tooth*		11¾		7½		8		8		7½		6¾		6¼		6		5⅓		5¾
Length of four upper true molar teeth taken together		5		3½		3⅓		3¾		3⅓		3¼		2¾		2⅗		2½		2½
" of palate		11½		6¾				8⅓		7⅓		6½		6¼		6		5½		
" of lower jaw, to back of condyle	1	5⅔		10				11¼		10⅓		9¾		9½		9		8¼		8
" of four true molar teeth of ditto taken together		5¾		3¾		3⅔		4¼		3⅔		3½		2⅝		3		2⅔		2⅘

* The only skull of *P. Swainsonii* I have seen has the hinder part imperfect; hence I cannot give its exact length: but, taking the proportions of the other parts as my guide, it must be *very nearly 1 inch 4 lines*; from the tip of the intermaxillaries to the back of the frontal bones, it measures 11¼ lines: the width of the palate between the last molars is 2¾: the width of the skull must be about 7 lines.

Genus *Dasyurus*.

Dasyurus. GEOFFROY, Annals du Muséum, tom. iii. p. 333. 1804.
" TEMMINCK, Monographies de Mammalogie, tom. i. p. 66. 1827.

Dasyuridæ with equal incisor teeth, $\frac{8}{6}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{2-2}{2-2}$; true molars, $\frac{4-4}{4-4} = 42$. Tail usually long, and well clothed with long, or moderately long hairs[1].

This section contains flesh-eating animals, all of which are of moderate size, and nearly all have the fur spotted. They have been compared to the Weasels and Martins of the order *Carnivora*, and, indeed, such is the general resemblance of these carnivorous Marsupialia to the ordinary carnivora, that some naturalists have associated them with that group; the resemblance, however, is a superficial one, and when the species of the two groups are compared in detail, many important differences present themselves. Many of these differences have already been alluded to, since they include characters which separate the order Marsupialia from other orders. I will now notice one or two points connected with the structure of the feet, as serving to illustrate the foregoing remarks.

In the order Carnivora I am acquainted with no species in which the scaphoid and lunare (two of the upper row of wrist bones) are not joined so as to form a single bone: the carnivorous Marsupials differ from the ordinary carnivora in having the bones in question distinct. In the true carnivora the astragalus articulates with the heel bone, or calcaneum, by two surfaces, between which there is a strong groove; this groove is not found in the Dasyurus, where the articular surface is continuous[2].

[1] Hence the generic name; from δασὺς, and οὔρος.

[2] The Thylacinus, which is merely a modified Dasyure, and which has been compared to the Dog, differs more from the Dog in the structure of the astragalus, than does the Dog from a Monkey.

The teeth of the Dasyuri differ but little from those of the Phascogales, which have been described in detail. The most striking difference consists in the reduced number of premolars, of which there is one less on each side of each jaw. The incisors form a continuous series in either jaw, the foremost pair of the upper jaw not being thrown outwards and forwards as in the Phascogales; the incisors, moreover, in the Dasyuri are very nearly equal in size. With regard to the true molars, the cusps are rather less sharply pointed than in the Phascogales; I can perceive no other difference in the molars of the species which I shall first describe; in the ***Dasyurus ursinus*** the teeth present some modifications which will be noticed when that animal comes under consideration. Some of the Dasyuri have no inner toe to the hind feet; we will commence with those which, like the Phascogales, have a small, nailless, and thumb-like inner toe to the hind foot.

DASYURUS HALLUCATUS.

North Australian Dasyurus.

Dasyurus hallucatus. Gould, Proceedings of the Zoological Society for February, 1842, Pt. 10, p. 41.

Fur of moderate length, and rather harsh ; general colour of the upper parts of the body dusky brown, much pencilled with yellowish, and having numerous irregular white spots ; under parts white, suffused with yellow : ear pale ; the fur which covers the root of the ear externally, whitish ; tail but little bushy, cylindrical, the apical half, or more, black ; fleshy pads on the under surface of the feet with minute oblique striæ.

Inhabits North Australia—Port Essington.

This is the smallest species of the true Dasyures, being a trifle less than the *D. Maugei* or *D. hallucatus* With the latter animal it might be confounded, having, like it, a thumb to the hind foot; upon a close examination, however, I discovered several characters by which it may be easily distinguished. It is of smaller size[1] than *D. Geoffroyi*, of a darker colour, the ears have the flesh of a paler colour, and they are clothed with pale hairs; the longer hairs which cover the root of the ear outside are whitish; the toes of the hind foot are longer, since I found them to be seven lines in length in *hallucatus*, and only 6¼ in a specimen of *Geoffroyi* which was of the same sex, and of considerably larger size; and, lastly, I find the whole sole, both of fore and hind feet in *D. Geoffroyi*, covered with minute, but distinct fleshy tubercles, (as is also the case in *D. viverrinus*), whilst in *D. hallucatus* I could scarcely perceive a trace of tubercles, and the fleshy pads at the base of the toes, and elsewhere, on which the tubercles were most distinct in *Geoffroyi*, are covered with numerous oblique or transverse grooves. The pads, moreover, at the base of the toes, were much narrower, and proportionately longer. I was led to examine these parts upon finding similar little striæ on the pads of the feet of many of the *Phascogales*.

The following description was drawn up from a female specimen in Mr. Gould's collection:—

Upper parts of body dusky brown, inclining to black, but pretty freely pencilled with yellowish, and having numerous irregular, and moderate sized, white spots, which extend likewise on the sides of the body; on the crown of the head are a few very small white spots; the under parts of the body are white, but suffused with yellowish; most distinctly so

[1] I have examined three specimens, and both sexes, of *D. hallucatus*, and many specimens of the *D. Geoffroyi*, also of both sexes.

about the throat; the cheeks, a large patch above the eye, and the sides of the body, are greyish; ears very pale (probably whitish flesh-colour in the living animal), thinly clothed with small pale hairs; immediately at the base externally the hairs are longer and dense, and of a yellowish white colour, and the part of the head immediately adjoining the root of the ear has similar pale hairs. The tail is immaculate, cylindrical; clothed throughout with longish harsh hairs, but by no means bushy; about one-third (basal portion) is brownish, but considerably pencilled with black, and the remaining portion is almost entirely black. The feet are brownish, and the region of the pouch is clothed with very dark red hairs, appearing as if stained with blood. The fur is less dense, and harsher than in *D. Geoffroyi*.

A female specimen in the British Museum collection differed from the above in having the general hue of the upper parts of the body yellowish brown—the ground colour being of a tolerably bright brown, but much pencilled with yellow; on the head and sides of the body the yellow prevails. A male specimen in the same collection agrees with my first description, in having the ground colour of the back almost black, and a similar specimen in the national collection, there are reasons to believe, is from Western Australia.

	Inches.	Lines.
Length from tip of nose to root of tail ...	12	0
" of tail	10	0
" of tarsus and nails	1	0
" of the longest toes and nails of the hind foot		7
" of ear	1	10
" from tip of nose to ear	2	3

DASYURUS GEOFFROYI.

Geoffroy's Dasyurus.

Dasyurus Geoffroyi. **Gould, Proceedings of the Zoological Society for November, 1840, Pt. 8, p. 151.**

Fur moderate ; general colour of the upper parts yellowish, pencilled with black, and having numerous irregular white spots ; body beneath white ; tail immaculate, black at the apex : hind foot with a distinct, but small inner toe, or thumb.

Inhabits Western Australia, Southern Australia, and New South Wales.

The present species somewhat resembles the pale variety of *Dasyurus viverrinus*, to which Geoffroy applied the specific name *Maugei*, but is distinguished most readily by its tail being much less bushy, and the hind foot being furnished with an inner toe, or thumb. The fur is moderately long, rather soft, and on the upper parts of the body of a greyish hue, but much suffused with yellow, and pencilled with black ; and these parts, moreover, as well as the sides of the body, are adorned with numerous irregular white spots : the head has a few small white spots only, and is often of a greyer hue than other parts, but the muzzle is somewhat tinted with brownish, and in front of the eye is a dusky patch ; the ears are dusky brown, and clothed with minute blackish brown hairs externally ; internally, with longish, pencilled black and grey hairs, at and near the anterior margin, but towards the apex, and on the hinder parts, the hairs are minute and brownish : the under parts of the body are white, or very nearly so ; the fore feet are brownish—sometimes brown-

white; the hind feet are nearly white, or greyish suffused with yellow: the tail is yellowish at the base, but much pencilled with black, the ends of the hairs being of that colour; the black gradually increases towards the tip of the tail, and usually about one-third is entirely black.

	MALE.		FEMALE.		MALE.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	14	0	13	0	16	0
" of tail	10	0	8	6	12	0
" of tarsi, including toes and nails ...	2	4	2	3	2	2
" from nose to ear	2	5	2	4	2	7
" of ear	1	2	1	2	1	0

The British Museum collection contains specimens of this species from Liverpool Plains, from the brushes on the Murray, and from the neighbourhood of Perth. The dimensions in the third column are taken from an unstuffed specimen, from Liverpool plains, in Mr. Gould's collection: a female specimen, also belonging to Mr. Gould, and which appeared to be adult, the teats being very large, was rather smaller. The mammæ were six in number.

The anterior portion of a skull of the *Dasyurus Geoffroyi* contained in the British Museum collection, agrees very nearly in size with the corresponding part of the skull of *D. viverrinus*, but differs in having the zygomatic arches thrown more boldly outwards, and in having the muzzle and nasal bones shorter. Its dimensions are as follows:—

	Inches.	Lines.
Length from the hinder root of the zygoma to the apex of the intermaxillary bones ...	2	5¼
Greatest width—which is rather behind the middle of the zygomatic arch	1	9
Depth of the zygoma behind		3¾

Width between orbits		8
" behind orbits		5
Length from anterior angle of orbit to apex of intermaxillaries	1	1¼
" of nasal bones		11⅔
Width of ditto behind		5½
" in front		2⅔
Length of palate	1	6⅓
Width of ditto between the hindermost molars		7⅔
Length of the four true molars taken together	0	8¼
Length of lower jaw, measuring to the back part of the condyle	2	3⅓
Height of ditto from the apex of the coronoid process		10¾

DASYURUS MACULATUS.

Spotted-tailed Dasyurus.

The Spotted Martin. PHILLIP'S Voyage to Botany Bay, p. 276. Martin, Cat. Pl. 46. 1789.

Viverra maculata. SHAW, General Zoology, vol. i. Pt. 2, p. 433. 1800.

Dasyurus macrourus. GEOFFROY, Ann. du Mus. tom. iii. p. 358. 1804.

" " PERON et LESUEUR, Voyage aux terres Australes, Pl. 33.

" " TEMMINCK, Monog. de Mammalogie, tom. i. p. 69. 1827.

" " WATERHOUSE, Naturalists' Library (Marsupialia), vol. xi. p. 130, Pl. 6.

" *maculatus*, Spotted-tailed Dasyure. GRAY, List of the Mammalia *in the British Museum, 1843, p. 98.*

Fur rather coarse, and by no means long: general colour reddish brown, or deep brown, pencilled with yellowish: body beneath yellowish: body and tail spotted with white.

Inhabits Van Diemen's Land.

In no known species of Dasyurus besides the present is the tail spotted as well as the body; hence the English name

given by Mr. Gray to this animal at once draws attention to its most striking characteristic. Its muzzle is proportionately shorter, and more obtuse, than in most of the preceding species; the ears are also shorter; and the tail is longer. The superior size and more robust form will also help to distinguish the *D. maculatus* from other species in which the hind foot is furnished with a rudimentary inner toe.

The fur in the present animal is harsh to the touch, and rather short; its colour varies from a very deep brown to a rich red-brown: the head is always paler than the back, and sometimes assumes a yellowish hue, being much pencilled with this pale tint; other parts of the body are more or less pencilled with yellowish, and the whole under parts of the body, as well as the fore legs and feet, are of a dirty yellow; the upper lip, chin, and throat, are of a more pure yellow tint: the toes of the fore feet are yellowish. The hind legs externally, and the hind feet, scarcely differ in tint from the upper parts of the body. The tail is nearly equal in length to the head and body taken together; cylindrical, and clothed with tolerably long and harsh hairs; its general colour is the same as that of the body, or very nearly so. The ears are short, clothed internally for the most part with small yellowish hairs, but at the margin the hairs are longer, and near the anterior angle they are tolerably long; on the outer side the ears are of the same colour as the crown of the head. With regard to the white spots with which this animal is adorned, they vary considerably in different individuals, and are very irregular in size and form; they are observed on the whole of the upper parts and sides of the body; some few are also visible on the under parts and on the legs; the head is usually immaculate, or presents but two or three very small spots. The spots on the tail are often large, and never numerous.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	17	0	24	0
" of tail	15	0	20	0
" *from nose to ear*	3	0	4	3
" of ear	1	0	1	2
" of hind foot and nails ...	2	0	3	7

The admeasurements given in the first column are from a specimen in the museum of the Zoological Society; and a very large individual, apparently a male, furnished the dimensions in the second column. I will now add the dimensions of two skulls of the *D. maculatus* contained in the museum of the Royal College of Surgeons.

	Adult. Inches.	Adult. Lines.	Aged. Inches.	Aged. Lines.
Total length of skull			3	6½
Length from hinder root of zygomatic arch to apex of intermaxillaries ...	3	1	3	0
Width	2	2	2	2⅛
" between orbits		10		9¾
" immediately behind orbits ...		5½		5
Length of nasal bones	1	3		
Width of ditto behind		5¾		
" " in front		3¾		
Length of palate	1	11	1	10½
Width of ditto between hindermost molars		9⅓		
Length of four true molars taken together		9¾		9½
" of lower jaw			2	11
Height of ditto from apex of coronoid process			1	2½

The Spotted-tailed Dasyurus appears to be confined to Van Diemen's Land. The earliest notice of the animal is that contained in Phillip's Voyage, under the name of the Spotted Martin, a name which, it appears, misled Shaw in his location of the animal, it being described by him under the generic title *Viverra*. Geoffroy's specific name *macrourus* is generally adopted for this animal, but as I do not perceive

that there were sufficient grounds for rejecting the earlier name of *maculatus*, I have followed Mr. Gray in restoring that appellation.

An account of the internal anatomy of the *D. maculatus*, or *macrourus*, will be found in the Proceedings of the Zoological Society for January, 1835, Part 3, p. 7. The specimen, which was dissected by Prof. Owen, was a female, and the Professor found the mammæ to be six in number, arranged three on either side, describing three quarters of a circle, and seated within a slight fold of integument of a corresponding shape.

DASYURUS VIVERRINUS.

The Viverrine Dasyurus.

The Spotted Opossum. PHILLIP, Voyage to Botany Bay, p. 147, Pl. 15. 1789.

Topoa Tafa. WHITE, Journal of a Voyage to New South Wales, p. 285, and Plate. 1790.

Didelphis viverrina. SHAW, General Zoology, vol. i. Pt. 2, p. 491, Pl. 111. 1800.

Dasyurus viverrinus, et *D. Maugei.* GEOFFROY, Annales du Muséum, tom. iii. pp. 359 and 360. 1804.

" " TEMMINCK, Monogr. de Mamm. pp. 71 and 72, Pl. 7, Figs. 1—8 ; skull and lower jaw.

Ears moderately large ; fur long, and rather soft ; tail bushy ; head and body spotted with white : general colour black, or brown-black—(*Dasyurus viverrinus* of authors) ; or grey, washed with yellow ; under parts of body and feet white ; tail whitish at the extremity—(*Das. Maugei* of authors).

In all systematic works up to a very recent period, the animal under consideration appears under two names —

Dasyurus Maugei and *D. viverrinus*: these names having been applied to animals differing much in the colouring of their fur, it seems never to have been suspected that they belonged to the same species, as has been proved by the fact that Mr. Gould found young individuals presenting both conditions in the same litter—that is, black and grey specimens[1]. As no individuals presenting an intermediate condition of colouring are found, I at first suspected the difference might be sexual, but such is not the case, since I have seen male specimens both of the black and grey varieties. The former vary only from brown-black to black; the under parts of the body, and the feet, are generally brownish. The fur on the back is grey next the skin, and that on the abdomen is also grey, but of a paler hue. The white spots on the body vary in size, some being very small, and others more than half an inch in diameter; on the head there are a few small white spots. The tail is bushy, being provided with long hairs averaging on the basal portion about an inch in length, but of double that length at the point; on the under surface they are, however, comparatively short: in length, the tail is about equal to the body. The ears are tolerably large, and somewhat attenuated at the apex; they are clothed with short black hairs; these are most abundant on the outer surface, but are also plentiful on the inner surface at the point and near the anterior angle, in which latter part the hairs are considerably longer than elsewhere. The flesh of the ear is of a pale pink colour in the living animal, as is also the naked tip of the nose and soles of the feet, the latter being also destitute of hair, but covered with small fleshy tubercles. There is no trace of an inner toe to the hind foot, unless it be a slight swelling of the flesh, marking the

[1] See Proceedings of the Zoological Society for November, 1840, Pt. 8, p. 151.

situation of the rudimentary metacarpal bone beneath[1]. The fore foot is provided with a remarkably large and prominent tubercle on the under side of the wrist, immediately behind which some long and bristly hairs have their origin.

I have before me very copious notes made upon a fine male specimen of the present species, which had lived for a considerable time in the menagerie of the Zoological Society; from these I have already made some extracts; I will now add the dimensions taken immediately after its death in December, 1839.

	Inches.	Lines.
Length from tip of nose to root of tail . .	15	0
" from nose to ear	3	0
" of ear	1	6
" of tail	8	6
" of fore foot and toes (the nails not included)	1	7
(or, with the nails)	1	9½
" of hind foot and toes	2	8
" of ditto, including the nails	2	10¾
Circumference of the body at the chest ...	8	6
Height of the animal at the shoulders, about	6	0

Such are the characters of the black variety of our animal, which is the *D. viverrinus* of authors; I will now briefly notice the grey variety.

Dasyurus Maugei. Geoffroy.

The general colour of the fur is here greyish, but much suffused with yellow. Each hair of the ordinary fur on the upper parts of the body is of a pale grey colour at the root,

[1] In *D. maculatus* (and no doubt in *D. Geoffroyi* and *D. hallucatus*), where a small inner toe is visible, the skeleton of the foot presents not only the inner metatarsal bone, but this is provided with the ordinary two phalanges.

pale yellow near the point, and black at the point, and the coarser interspersed hairs have their visible portions almost entirely black; on the feet and under parts of the body the hairs are of an uniform yellowish white tint. The sides of the face are almost of an uniform pale yellow. The ears are for the most part rather sparingly clothed with pale hairs: at their base externally is a white spot. The tail is bushy, of the same general hue as the body at the base, but becomes gradually paler towards the opposite extremity, and is terminated with white or dirty yellow-white hairs.

	Inches.	Lines.
Length from tip of nose to root of tail ...	12	0
" of tail (not including the long hair) ...	9	0
" from tip of nose to ear	2	8
" of ear	1	3
" of hind foot (not including the nails) ...	2	1½

I have seen specimens whose dimensions slightly exceeded the above, which are taken from a stuffed specimen in the museum of the Zoological Society. Upon comparing the skins of the black and the grey specimens toget I could perceive no constant difference of size, as M mminck found in the specimens which came under his nc [1].

Both varieties of the Viverrine Dasyurus are nmon in New South Wales and Van Diemen's Land.

Subjoined are the dimensions of some skulls the grey variety.

[1] This author observes, that the *D. viverrinus* is *constantly* ler than the *D. Maugei*, but the dimensions taken by myself from a rec pecimen of the former animal, denote a larger size than those given b Temminck from the *D. Maugei*.

	Adult, probably a Female.		Aged, probably a Male.		Adult.		Adult.	
	Ins.	Lines	Ins.	Lines	Ins.	Lines	Ins.	Lines
Length of skull … …	2	11½	3	2	2	11	2	10½
Width of ditto … … …	1	8	1	10½	1	8	1	7⅛
" between orbits … …		8¾		9¾		8¾		7¾
" immediately behind the orbits … … …		6		6		6		5⅔
Length of nasal bones … …	1	1¾	1	3½	1	0½	1	0¼
Width of ditto behind … …		5½		5¾		5		5¼
" " in front …		2		3		2¼		2½
From anterior angle of orbit to apex of intermaxillaries .	1	3⅛	1	4½	1	3½	1	3
Length of palate … …	1	7	1	8⅔	1	7	1	7
Width of ditto between posterior molars … … … …		7½		8⅛		7⅔		
Length of four true molars taken together … …		8⅓		9		8½		8½
" of lower jaw … …			2	6			2	4
Height of ditto from apex of coronoid process … …			0	11½				10

Sub-genus, *Sarcophilus*.

Sarcophilus[1]. F. CUVIER, Mammifères, 70me livr. 1838.

Diabolus. GRAY, in Appendix to Grey's Journals of Two Expeditions in North-West, and Western Australia. 1841.

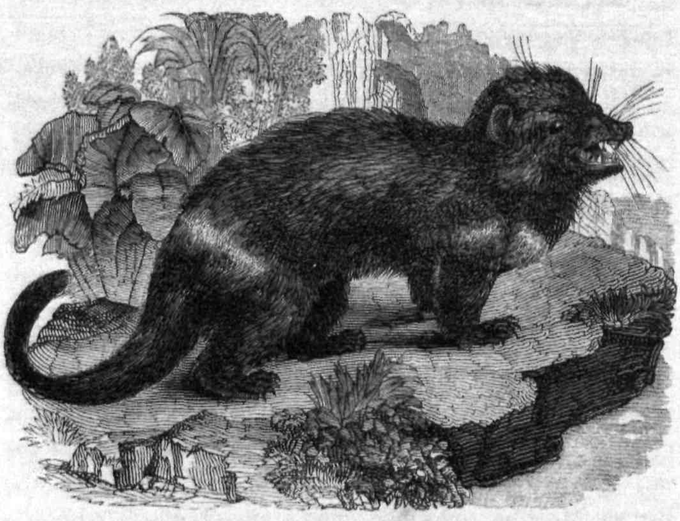
Dasyuri with the body stout; the head short, and very broad; the tail shorter than the body; premolar teeth with the antero-posterior and transverse diameters equal, or nearly so.

Unfortunately I am not aware what are the points which induced M. F. Cuvier[2], or Mr. Gray, to separate the *Dasyurus*

[1] From σάρξ, flesh; and φίλος, loving.

[2] The great work of MM. F. Cuvier and Geoffroy, in which the section *Sarcophilus* is proposed, although in our National Library, is not complete, and is deficient of the part containing the account of the *Dasyurus ursinus*. The section *Diabolus* of Mr. Gray I do not find anywhere characterised.

ursinus of authors, from the other Dasyuri, but I presume they are derived from the proportions of the animal, which are more bulky than in other Dasyuri, and perhaps from the comparatively short tail. The form of the skull, and some slight modifications observable in the structure of the teeth, no doubt were also taken into consideration. With regard to the latter, the following points struck me upon comparing the teeth of *D. ursinus* with those of *D. maculatus*. The premolars, owing to the shortness of the muzzle in *D. ursinus*, are crowded together, whilst in Dasyurus proper they are somewhat isolated, and they differ, moreover, in having the transverse diameter as great as the longitudinal; the inner lobe of the upper true molar teeth is less developed, and the anterior lobe is smaller in proportion to the hinder one: in the foremost true molar this lobe presents but one point; in the second it is partially divided, and in the third true molar the anterior lobe is distictly divided The hindermost of the two external lobes differs from the corresponding lobe in the true molar of *D. maculatus*, in being considerably compressed, and the small tubercle, which, in the typical Dasyuri, is situated on the outer side of the tooth, and about midway between the anterior and posterior angles, is here brought near the mesial tubercle: in the hindermost molar, the tubercle in question is obliterated, as is the case in the molars of the Thylacinus. These observations refer only to the three foremost of the upper true molars; the hindermost molar is a narrow, transverse, and very simple tooth. The true molars of the lower jaw differ in having the posterior lobe, or heel, less developed, and these teeth want the inner tubercle, which is found midway between the extremities of the tooth of *Dasyurus viverrinus*, *D. Maugei*, &c.



DASYURUS (*Sarcophilus*) URSINUS.

Ursine Dasyurus[1].

Didelphis ursina.	HARRIS, Linnean Transactions, vol. ix. p. 176, Pl. 19, fig. 2.
Dasyurus ursinus.	GEOFFROY, Annales du Muséum, tom. xv. p. 305.
" "	TEMMINCK, Monographies de Mammalogie, tom. i. p. 69.
Diabolus ursinus.	GRAY, in Appendix to Grey's Journal. List of the Mammalia in the British Museum, 1843, p. 97.

Fur coarse, moderate as to length, and black, excepting on the head, tail, and under parts of the body, where it is brown-black: a broad white band usually crosses the chest, and

[1] The Ursine Dasyurus is called by the colonists "The Devil," or "Native Devil;" I see no necessity for adopting such barbarous names, nor do I think it desirable to adopt other names given by our colonists, when they convey an erroneous impression of the nature of the animals which have received them.

extends backwards on either side, more or less over the base of the fore leg; and a second band crosses the back, near the root of the tail.

Inhabits Van Diemen's Land.

The *Dasyurus ursinus* may be compared to a bear, in the general proportions of its body and limbs, as well as in the texture of its fur: in many of its actions, and in its gait, moreover, the original describer of this species, Mr. Harris, was struck with a resemblance between the two animals. The tail of the Dasyurus, however, is long, when compared with that of a bear. In size it is about equal to a badger.

To the short diagnosis already given, little need be added with regard to the specific characters of the animal. The white markings noticed, vary in extent in different individuals, and not unfrequently on opposite sides of the body of the same individual. Of three specimens contained in the British Museum collection, one is entirely black, with the exception of a white spot on the chest; the second is also black, with the exception of a white mark on the chest, and a white patch immediately behind the base of the fore leg; and the third presents the more common condition of these markings, having the chest band entire, and running back over the base of the legs on to the sides of the body; the transverse band on the hinder part of the back is also distinct. The ears are rather short, but very broad: the tail is about half as long as the head and body taken together, and clothed with tolerably long, coarse hairs.

A very fine specimen of the Ursine Dasyurus, which died in the menagerie of the Zoological Society, furnished the subjoined dimensions.

	Inches.	Lines.
Length from tip of nose to root of tail ...	23	9
" of tail	11	0
Circumference of body at the chest, about ...	20	0

	Inches.	Lines.
Length from nose to ear	5	3
" of ear	1	6
" of hind foot	4	7

To these admeasurements I will add those of a skull in the collection of the Royal College of Surgeons:—

	Inches.	Lines.
Total length of skull	4	6
Width	3	6
" between orbits	1	6½
" in the temporal region		9
Length of nasal bones	1	8
Width of ditto behind		7½
" *in front*		4⅛
Length of palate	2	6
Width of ditto between the hindermost molars	1	9⅔
Length of posterior palatine openings ...		5
" of four true molar teeth taken together	1	5⅔

The skull of the *D. ursinus* is short, very broad, and somewhat depressed; the great breadth is produced by the bold arch formed by the zygoma, near the posterior root of which the skull is broadest, and from that point it gradually tapers to the front. The temporal region is much contracted, and the sagittal crest considerably elevated, circumstances which, combined with a strong zygoma, much arched in the horizontal direction, and also in the vertical, indicate great power in the muscles which work the lower jaw. The interorbital space is broader than in other Dasyuri, and the frontals throw out a distinct post-orbital process; a smaller post-orbital process arises from the malar bone[1]. The posterior palatine openings are of moderate size, and remote from the hinder boundary of the palate, being situated opposite the interspace of the second and third true molars.

[1] In having a small post-orbital process to the frontal and malar bones, *Dasyurus maculatus* approaches most near to the Ursine species.

In a skeleton of the present animal, in the Royal College of Surgeons, I find one the of humeri imperforated at the lower extremity but the opposite humerus has the inner condyle perforated [1].

The Ursine Dasyurus is found only in Van Diemen's Land, and it is to Mr. Harris that we are indebted for the earliest account of this singular animal: but little has been added to that gentleman's observations upon its habits, which appeared in the *Linnean Transactions*.

"These animals," Mr. Harris observes, "were very common on our first settling at Hobart Town, and were particularly destructive to poultry, &c. They, however, furnished the convicts with a fresh meal, and the taste was said to be not unlike veal. As the settlement increased, and the ground became cleared, they were driven from their haunts near the town to the deeper recesses of the forests yet unexplored. They are, however, easily procured by setting a trap in the most unfrequented parts of the woods, baited with raw flesh, all kinds of which they eat indiscriminately and voraciously; they also, it is probable, prey on dead fish, blubber, &c., as their tracks are frequently found on the sands of the sea-shore.

"In a state of confinement they appear to be untameably savage, biting severely, and uttering at the same time a low yelling growl. A male and female, which I kept for a couple of months chained together in an empty cask, were continually fighting; their quarrels began as soon as it was dark (as they slept all day), and continued throughout the night almost without intermission, accompanied by a kind of hollow barking, not unlike that of a dog, and sometimes a sudden kind of snorting, as if the breath was retained a

[1] In having the humerus imperforated on the inner condyle, the true Dasyures differ from the Phascogales, and, indeed, from all other *Marsupiata*.

considerable time, and then suddenly expelled. They frequently sat on their hind parts, and used their fore paws to convey food to their mouths. The muscles of the jaws were very strong, as they cracked the largest bones with ease asunder."

According to Mr. Gunn[1], these animals commit great havoc among the sheep, and, notwithstanding their comparatively small size, they are so fierce, and bite so severely, that they are a match for any ordinary dog.

Dasyurus laniarius (Fossil).

Although the section *Sarcophilus* is at present confined to Van Diemen's Land, such was not always the case, since remains of a species nearly allied to the *Sarcophilus ursinus* have been found on the main land. These remains, consisting of portions of both jaws, and exhibiting nearly the whole of the molar teeth, appertained, however, to an animal of a larger size than the recent species. Two premolar, and two true molar teeth, in a fragment of an upper jaw, in the Museum of the College of Surgeons, measure together one inch and a half, whilst the corresponding teeth in the *Dasyurus*, or *Sarcophilus ursinus*, occupy an extent of an inch and a quarter only; and a last molar tooth of a lower jaw of the fossil Dasyure, measures from front to back seven and a half lines, being two and a half lines more than the hindermost molar of *D. ursinus*.

All the fragments referred to, were found in the caves of Wellington Valley, and are described by Prof. Owen, some of them in Mitchell's Eastern Australia, vol. ii. p. 363, and the remainder in the Catalogue of the Fossil Organic Remains contained in the Museum of the Royal College of Surgeons.

[1] Annals of Natural History, vol. i. p. 101.

Genus, *Thylacinus*.

Thylacinus.[1]. TEMMINCK, Monographies de Mammalogie, tom. i. p. 60, 1827.

Peracyon[2]. GRAY, Annals of Philosophy, for November, 1825, vol. x. of New Series, p. 344.

Dasyuridæ with the outermost incisors slightly exceeding the others in size; the premolars separated from each other, and $\frac{3-3}{3-3}$ in number; the three foremost of the upper true molars with a much elevated central cusp, an anterior and posterior cusp but little elevated, and an internal lobe; the hindermost upper true molar transverse; the true molars of the lower jaw nearly resembling those of the upper jaw, but destitute of internal lobe, and with the central cusp more elevated; the humerus with the inner condyle perforated; the hind foot destitute of inner toe; marsupial bones wanting; the females with a distinct pouch, and provided with four mammæ.

The premolars are more numerous in *Thylacinus* than in *Dasyurus*, there being three, instead of two, of these teeth on either side of each jaw: the teeth, indeed, agree in number with those of *Phascogale*, though in other respects they differ much: the incisors differ, inasmuch as the outermost, instead of the innermost pair, are the largest; the premolars differ in being isolated, and the true molars are of a more simple form. The canine teeth are of large size, of a simple, elongated conical form, and are slightly recurved at the apex; those of the upper jaw are separated from the incisor teeth by a

[1] From θύλακος, a pouch.

[2] From pera, a pouch; and κύων, a dog (?) Although Mr. Gray proposed the above name for the present genus in 1825, so far as I can learn the section was first characterized by M. Temminck.

large and deep concavity into which the apex of the canine of the lower jaw is lodged when the jaws are closed[1]. The premolar teeth present a triangular outline when viewed from the *outer or inner* side, *and have a small posterior* basal cusp: the two foremost of the upper premolars are separated from each other, or from the canine; the third upper premolar is in contact with the true molars; but in the lower jaw *all the premolars are isolated. The crowns of the three* foremost upper true molars are in the form of a right-angled triangle, of which one of the sides is about one-fourth shorter than the others; this short side is in front. Viewed from the *outer* side, *these molars present a large central cusp*, and two smaller and much less elevated cusps, placed one behind, and the other in front of the principal cusp: the foremost cusp is separated by a distinct transverse notch from the body of the tooth. The inner lobe of the tooth is but little elevated. The hindermost true molar is nearly of the same structure as the others, but of smaller size, and so placed that its greatest diameter is in the opposite direction to the long diameter of the other molars. The true molars of the lower jaw have the crown divided by transverse incisions into three cusps, of which the central one is the largest, pointed, and much elevated.

But one recent species of this genus is known, and that is confined to Van Diemen's Land; but amongst the fossil remains found in the caves in Wellington Valley already alluded to, Prof. Owen has detected some portions of lower jaws, which he regards as belonging to a species of *Thylacinus.* An anterior extremity of one of these fossils is figured in Sir T. Mitchell's Australia (vol. ii. pl. 31, fig. 7), and other portions subsequently sent to England are de-

[1] The Dasyuri all present this character, which is not found in the ordinary *Carnivora*; in those animals the lower canine passes on the outer side of the upper jaw, when the mouth is closed.

scribed in the Catalogue of the College of Surgeons, under the name

Thylacinus spelæus. OWEN.

The principal known differences between this fossil species and the recent one are, that the lower jaw is deeper, being nine lines below the first premolar tooth, whilst in *Thylacinus cynocephalus* the depth of the jaw at the same point is but seven lines. A penultimate molar tooth of the lower jaw in the College of Surgeons' Museum, when compared with the corresponding tooth of the recent species, " differs, moreover, in having a small accessary cusp on the inner side of the large middle compressed cusp, which cusp is also less deeply and angularly divided from the anterior lobe of the tooth.[1]" In this last mentioned character the fossil agrees more nearly with *Dasyurus* proper, than with *Thylacinus*.

[1] Owen, in Catalogue of the Fossil Remains contained in the Museum of the College of Surgeons, p. 336.

THYLACINUS CYNOCEPHALUS.

Dog-headed Thylacinus.

(*Plate* 16, fig. 2).

Didelphis cynocephala. Harris, Transactions of the Linnean Society, vol. ix. p. 174, Pl. 19. 1807.

Dasyurus cynocephalus. Geoffroy, Annales du Muséum, tom. xv. p. 304.

Thylacinus " Fischer, Synopsis Mammalium, p. 270.

A. Wagner, in Schreb. Saug. Suppl. 109—110 Heft, p. 19.

Waterhouse, Nat. Library (Marsupialia), vol. xi. p. 123, Pl. 5.

Thylacinus Harrisii. Temminck, Monographies de Mammalogie, vol. i. p. 63, Pl. 7, figs. 1—4.—the skull and lower jaw.

Peracyon cynocephalus, the Tasmanian Wolf. Gray, List of the Mammalia in the British Museum (1843), p. 97.

Tiger, Hyæna, Zebra-Opossum, Zebra-Wolf, and Dog-headed Opossum of the colonists.

About equal in size to the Common Wolf; head formed like that of a Dog; tail about half the length of the body; fur short, and closely applied to the skin; general colour grey-brown; the back with from about twelve to fourteen transverse black bands, narrow and short on the fore parts of the back, longer and broader on the hinder parts; region of the eye pale; tail with short fur, nearly like that of the body, excepting on the under side of the apical portion, and at the tip, where the hairs are comparatively long.

Inhabits Van Diemen's Land.

The general resemblance which the *Thylacinus* bears to a Wolf or large Dog, has struck many, and, indeed, has caused it to be, by some, arranged amongst the ordinary Carnivora[1].

[1] The Thylacinus is arranged by Mr. Swainson amongst the *Felidæ*, or Cat Family, and in support of his views, the author quotes some observations from Temminck with regard to the dentition of the animal; Mr. Swainson,

Its legs, however, are proportionately shorter than in the Wolf, and, judging from the structure of its foot, its body must be brought much nearer to the ground, in walking, than that of the Wolf, it being what may be termed a semi-plantigrade animal. The muzzle is more elongated and narrower than in other *Dasyuridæ*. The ears are rather short, very broad at the base, and somewhat pointed at the opposite extremity; they are well clothed with hairs, both internally and externally; on the outer side the hairs are coloured like those on the upper part of the head, excepting towards the tip of the ear, where they are paler; on the inner side the hairs are of a brownish white hue, slightly inclining to yellow; near the anterior angle they are very long. The eyes, according to Mr. Harris, are large and full, of a black colour, and provided with a nyctitant membrane. Long black bristles spring from the upper lip; a few are also observed on the cheeks, and above the eye. The fur of the animal is short, somewhat closely applied to the skin, though of a slightly woolly texture, owing to each of the hairs of which it is

however, restricts his quotation to those parts only, of M. Temminck's account, in which certain resemblances existing between the teeth of the Thylacinus and those of some of the true Carnivora are pointed out. Certain teeth in the animal under consideration, it is true, will bear a close comparison with certain teeth found in Cats and Dogs, but striking differences are observable when the whole series of the teeth of the carnivorous marsupial quadruped is compared with that of any mammal belonging to the true *Carnivora*. The *increase in the number of the incisors, and true molars, in the Thylacinus*, becomes important when it is found that these teeth are implanted in a skull and lower jaw which in every respect are conformable to the marsupial type of structure, and that in that type only is this increase found. The passage quoted from M. Temminck, however, will not bear the construction which Mr. Swainson has put upon it; M. Temminck compares the true molars of the Thylacinus with the principal *false molar* ("carnassièr") of the Cats and Dogs. Now, the *true* molars of the last mentioned animals differ much in *their structure from the corresponding teeth in the pouched Thylacinus*; and hence the arguments of Mr. Swainson, founded upon a presumed resemblance in the dentition of the animals mentioned, are not valid.

composed being waved. The general tint of the animal is greyish brown, but faintly suffused with yellowish; on the under parts of the body of a paler hue than the upper. The fur on the back is of a deep brown colour next the skin, and each hair (excepting those which form the transverse black bands) is yellowish brown towards the point, and dusky at the point; on the abdomen the hairs are of a paler brown at the root, and brown-white externally. The black bands alluded to are usually about fourteen in number; they commence immediately behind the shoulders, and are at first narrow and confined to the back, but, proceeding towards the tail, they become gradually broader, and are more extended in the lateral direction; those on the haunches are the longest, and are often forked at their extremities. The general tint of the head is rather paler than that of the body, and the region of the eye is of a whitish hue, but a dark spot is observable at the anterior angle of the eye, and a narrow dark line runs over the eye: the muzzle is dusky; the edge of the upper lip white. The limbs, externally, and the feet, scarcely differ in colour from the body. The large pads at the base of the toes of the fore foot are naked, and exceedingly rough, and a narrow naked mark runs backwards from these pads to the wrist; a similar narrow naked mark runs along the under side of the hind foot, from the heel to the great rough pads at the base of the toes. The claws of the fore and hind feet are nearly equal in size; short, thick, but slightly compressed, and solid; and they are of a brown colour. The tail is about half as long as the body; thick at the base, where it is covered with somewhat woolly fur, like that on the body, but at about the commencement of the second fourth of the tail the hairs become short and harsh, and are closely applied to the skin; they are brown on the upper surface, and pale brown on the under; on the under surface of the apical portion of the tail, however, the hairs are comparatively long,

as well as at the point, where they are blackish: about three or four black bands are observable on the basal part of the tail above.

The region of the pouch in the female is clothed with rusty red hairs.

The dimensions of the female specimen from which the above description is taken, will be found in the first of the columns of admeasurements; those added in the second are from a male specimen in the British Museum collection.

	Female.		Male.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	33	0	45	0
" of tail	14	0	20	0
" from tip of nose to ear ...	6	0	7	9
" from ditto to eye, about ...	3	0	4	3
" of ear	2	0	2	2
Width of ditto at the base	2	6	3	3
Length of hind foot	5	3	6	7
Height at shoulders, about ...			18	6

A skeleton of an adult male Thylacinus in the Museum of the College of Surgeons measures in total length about five feet, and its height at the shoulders is about 21¼ inches. The subjoined dimensions are taken from skulls in the British Museum, and that of the Royal College of Surgeons.

	MALE? British Museum.		FEMALE? College of Surgeons.		MALE. College of Surgeons.		FEMALE. College of Surgeons.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	9	6	7	6	9	0	7	9
Width	5	7	4	1½	5	6	4	3
" between orbits	2	1	1	7				
" in the temporal region ...	1	5	1	3½				
Length of nasal bones	3	8	3	0				
With of ditto behind	1	3	1	0				
" " in front		8¾		6				
Length of palate	4	9½	3	11				
Width of ditto between last molars	1	10	1	6½				
Length of posterior palatine openings	1	1½	1	0½				
" of four upper true molar teeth, taken together ...	1	10	1	8				
" of lower jaw	7	9	6	3				
Height of ditto from apex of coronoid process	2	11	2	1½				

The auditory bullæ are small, little convex, and formed, as in nearly all the other Marsupialia, of the alæ of the sphenoid; the palatine openings are tolerably large, and situated for the most part in the palatine bone. The nasal process of the intermaxillary bones notches into the nasal bones in a very unusual manner. The facial portion of the skull is very narrow, and considerably elongated; the skull is again much contracted in the temporal region, but broad between the orbits, which latter are more than three parts enclosed, there being a distinct post-orbital process to the frontal, and a corresponding process to the malar bone. The zygoma is thrown boldy outwards, leaving a large temporal fossa, and it is also arched upwards to furnish greater resistance to the muscles of the lower jaw.

Mr. Harris, who was the first to make this animal known, states that it inhabits amongst caverns and rocks in the deep

and almost impenetrable glens in the neighbourhood of the highest mountains of Van Diemen's Land The specimen from which his description was taken was caught in a trap baited with Kangaroo's flesh: it remained alive but a few hours, having received some internal hurt whilst being secured. From time to time it uttered a short guttural cry, and it appeared exceedingly inactive and stupid, and, like the owl, had an almost continual motion of the nyctitant membrane of the eye. Remains of an Echidna were found in the stomach of the animal. Mr. Gunn informs us that these animals are common only in the remoter parts of the colony, and are frequently caught at Woolnooth and the Hampshire Hills. *They attack the sheep at night, but are occasionally seen during the day-time; upon which occasions, perhaps from imperfect vision, their pace is very slow. Mr. Gunn also observes that the Thylacinus sometimes attains so* large and formidable a size that a number of dogs will not face it. That gentleman denies that the tail of the animal is compressed, as has been stated by some authors, and his observations do not confirm the aquatic habits which have been attributed to it.

Prof. Owen, who has prepared a memoir upon the internal anatomy of the Thylacinus, found no marsupial bones in three of the specimens which he dissected, two of which were full-grown females, and the third a male; but in a large and old male he detected a few particles of the bone-salts in the centre of the fibro-cartilage. The pouch, Prof. Owen observes, is well developed in the female Thylacine, and in one of the specimens dissected, four well developed teats, each four inches long, indicated that it had contained four young ones when, or shortly before, it was killed[1].

[1] See Proceedings of the Zoological Society for December, 1843, p. 148.

DIDELPHIDÆ; or OPOSSUM FAMILY.

Didelphidæ. WATERHOUSE, Nat. Libr. vol. xi. (Marsupialia), p. 75. 1841.
Didelphina. GRAY, Annals of Philosophy, vol. x. (New Series), p. 340. 1825.

Marsupialia with incisor teeth, $\frac{5-5}{4-4}$; canines, $\frac{1-1}{1-1}$; premolars, $\frac{3-3}{3-3}$; molars, $\frac{4-4}{4-4}$: feet five-toed, plantigrade: cæcum moderate.

The family *Didelphidæ* is composed of numerous Marsupial animals, which at the present time are confined to the American continents. They are of small size, the largest known species being scarcely equal to the Common Cat in bulk, whilst by far the greater portion of them would bear a closer comparison with the Common Rat in this respect. Their food consists chiefly of insects; but small reptiles, as well as birds and their eggs, are attacked by the larger species.

Some of the Didelphidæ, or Opossums, have no pouch, or at least this receptacle for the young is found only in a very rudimentary condition in certain species, and the young, which at first remain firmly attached to the nipples, are subsequently carried upon the back of the parent, where they retain their position by entwining their tails round that of the mother. The mammæ are very numerous, varying from nine to thirteen, the odd one being in the centre of a circle formed by the other nipples. One of the species of the present family (the Yapok) lives in the water, and differs from others of its group in having the feet webbed; the remaining species live for the most part in trees, in the hollows or amongst the foliage of which, they remain concealed during the day-time, sallying forth in the night only to procure their food.

The Opossums may at once be distinguished from other Mammalia by the great number of their incisor teeth, there being ten in the upper, and eight in the lower jaw. These teeth are arranged in each jaw nearly in the form of a semicircle: in the upper jaw the two foremost incisors are rather longer than the rest, and are generally separated from them by a narrow space; their form is nearly cylindrical, but at the apex they are slightly dilated. The canine teeth are well developed, and those of the upper jaw are the larger. The premolars are two-rooted, compressed, and pointed, and have a small posterior talon. The true molars of the upper jaw are three-rooted, and have the crown of a triangular form, and tubercular: those of the lower jaw are longer than broad, and, when viewed from either the outer, or inner side, they present three prickly cusps, of which the middle cusp is the highest; the foremost of these cusps is single, whilst the others are double, and there are therefore five prickly cusps to each molar. With regard to the general form, these animals, for the most part, have very nearly the proportions of the Common Rat, excepting that they have the muzzle more elongated, and terminated in a distinct naked muffle. In the larger species the body is proportionately stout. The tail is almost always very long, nearly destitute of hair, excepting at the root, and covered by a scaly skin[1]: this organ is here (as in many other of the Marsupialia) prehensile. The feet are naked beneath, five-toed, and all the toes are furnished with moderate-sized claws, excepting the inner toe of the hind foot, which is clawless.—(See Pl. 10, fig. 3). In the possession of a cœcum, and in having ten incisor teeth in the upper jaw, the *Didelphidæ* agree with the *Peramelidæ*; the incisor teeth of the Opossums, however,

[1] Very minute scattered hairs only, are found on the tail of the Opossums, excepting at the root, where the tail is usually clothed with fur like that on the body.

agree more closely in their form and arrangement with those of the Dasyuri. The molar teeth of the Opossums differ from those of the Perameles group in wanting the posterior inner lobe, and in this and every other respect they agree with the molar teeth of the Dasyuri. The structure of the skull, and of the extremities, is nearly the same in the last-mentioned group and the Opossums; the only difference worthy of notice consists in the thumb of the hind foot being more developed in the Opossums; but, compared with the *Peramelidæ*, the animals under consideration differ much in external characters, and very considerably in the structure of the skull. The situation of the *Didelphidæ* in a natural system, then, should be between the *Dasyuridæ* and the *Peramelidæ*, but nearer to the first of these two families.

Genus, *Didelphys.*

Didelphis[1]. Linn. Syst. Nat. i. p. 71.
Philander. Briss. Règn. Anim. 1756.

Didelphidæ without cheek pouches, and in which the toes of the feet are free—that is, not joined by a web.

Section 1. *Opossums in which the pouch is well developed.*

We shall commence our descriptions with those species which are of large size, and have very long hairs interspersed with those which form the ordinary fur, as is the case in the Common Opossum of North America.

[1] From δὶς and δελφὺς, double uterus.

DIDELPHYS VIRGINIANA.

Virginian Opossum.

Virginian Opossum. PENNANT, Synopsis of Quadrupeds, p. 204, Pl. 31, f. 1. 7171.
Didelphis Virginiana. SHAW, General Zool. vol. i. Pt. 2, p. 473, Pl. 107. 1800.
" " TEMMINCK, Monogr. de Mammalogie, tom. i. p. 27.
Sarigue des Illinois et Sarigue à longs poils. BUFFON, Quad. Suppl. vol. 7, Pls. 33 and 34.
Sarigue à oreilles bicolores. CUVIER, Règne Animal, tom. i. p. 175.

Fur long, loose, and somewhat woolly ; white, the tips of the hairs more or less suffused with brown-black : numerous long interspersed white hairs, mixed with those of the ordinary fur : a dusky patch at the anterior angle of the eye : ears naked, black, with the tip white : tail having the naked portion at first black, but terminated with white : legs and feet brown, or brown-black.

Inhabits North America.

The Virginian Opossum is one of the largest species of its genus, being about equal in bulk to the Common Cat. It has a large, elongated, and pointed head, terminated by a naked, and flesh-coloured muffle. The ears are tolerably large, oval-shaped, and naked, and from their black colour form a strong contrast with the white head of the animal. The tail is nearly equal to the body in length ; at the base it is clothed with fur like that on the body, this occupying one-fourth of the entire length ; the remaining portion is protected by a scaly skin, and between the small scales, which nearly resemble those of the tail of the Rat, are some very small hairs : of the scaly portion, the first, or basal half, is black, and the terminal half, white ; or sometimes about

one third is black, and the rest white. The fur of the animal is somewhat woolly, very long, loose, and moderately soft; it is of a dirty yellowish white hue, and the hairs of the ordinary fur are more or less suffused with black or brown at the extremity; most distinctly so on the back; numerous very long silky hairs are interspersed with those which form the chief clothing of the animal, the visible portions of which are white. The head is white, but usually the hairs on the occipital portion are dusky at the point, and an indistinct mark running forwards from this part, and terminating between the eyes, is formed by the hairs being similarly suffused with brownish at the point on the middle part of the head. The eye is narrowly encircled with dusky brown, excepting in front, where the dark hue is more extended, and forms a tolerably conspicuous spot. The ears are sometimes entirely black, but usually they are tipped with white, the white in some individuals forming a narrow edging, and in others, is rather more extended. The legs and feet are of a brownish black colour.

A specimen of the Virginian Opossum in the British Museum is entirely white, with the exception of the ears, which are black, but margined with white at the apex, and a small patch in front of the eye, which is brown.

			Female.		Male.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	22	0	21	0	22	0
" of tail	15	0	12	0	14	0
" from nose to ear	4	5	4	9	4	9
" of ear	1	5	1	6	1	6
" of hind foot	2	5	2	7	2	7

The structure of the skull of the *D. Virginiana* indicates great power in the action of the jaws, the temporal ridges

meeting so as to form a much-elevated sagittal crest; the *interorbital space is moderately broad, but in the temporal region* the skull is much contracted: an obtuse post-orbital process is thrown out from the frontal bone, and the malar bone is also produced into an angular process, so as partially to separate the temporal from the orbital fossa. The zygomatic arch is curved both outwards and upwards. The nasal *bones are broad towards the hinder part, and are produced* posteriorly so as to encroach much upon the frontal bones. This is one of the points of distinction which strikes one upon comparing the skulls of the Opossum with that of a Dasyurus, the nasal bones in the animals of that genus being much less produced in the mesial line of the skull; their greatest diameter is at the hinder part, whilst in the Opossum the broadest part of the nasal bones is always considerably in advance of that point. Another distinction observable in these bones, when the *Dasyuridæ* and *Didelphidæ* are compared, consists in their being pointed in front and produced considerably over the entrance of the nasal cavity in the latter group, whilst in the Dasyures the nasal bones are truncated or emarginated in front, so that the upper boundary of the nasal cavity terminates in a line with the lateral boundaries formed by the intermaxillaries, or behind that line. The facial portion of the skull is larger, the cerebral portion smaller in proportion than in the Dasyuri[1], and the palate is longer.

[1] The brain, as in a great measure indicated by the structure of the skull, is remarkable for the proportionately large size of the olfactory lobes, and the small size of the cerebral hemispheres; these latter are much contracted in front, and destitute of convolutions. As compared with the brain of the Mammalia of the higher classes, that of the Opossum furnishes the most remarkable contrast in its small size in proportion to the bulk of the animal, and the small development of the cerebrum, which is here distinctly separated from the cerebellum, and leaves exposed the optic lobes above, as well as the *crura cerebri* below. The Dasyuri come next in grade, and their brain con-

	Inches.	Lines.
Total length of skull	4	6
Width	2	6
" between orbits	1	0
" in the temporal region		5½
Length of nasal bones	2	2
Greatest width		9½
Width in front		3½
Length of palate	2	5
" of four true molar teeth taken together		9½
" of principal palatine openings ...		6

With regard to other parts of the skeleton, there is one point which I should not omit to notice, and that relates to the structure of the neck, the second, third, fourth, fifth, and sixth vertebræ of which are remarkable for the great development of the spinous processes, and more particularly for the great thickness, or transverse diameter, of these processes, and their mode of junction with each other, which is such as to preclude any upward flexure of the neck in the region of these vertebræ. I have met with no very satisfactory explanation of the use of this structure, which is found not only in the Virginian Opossum, but likewise in the *D. cancrivora*, and no doubt in the other large species of *Didelphys*.

The Virginian Opossum, according to M. Temminck, is found from Mexico to the southern provinces of the United States; according to Pennant, it occurs also in Brazil and Peru, but in making this statement he has undoubtedly confounded some other nearly allied species with the *D. Virginiana*. This animal is said to be very destructive to poultry, sucking their blood, but not eating the flesh; it feeds

sequently differs widely from that of the placental Carnivora, in the points just alluded to, as well as in that remarkable character of the Marsupial brain—the almost total absence of *corpus callosum*—which was first pointed out by Prof. Owen, and has since been confirmed by the able editors of Cuvier's Anatomie Comparée—See p. 102 of vol. iii.

upon roots and fruits, is very expert in climbing trees, from the branches of which it suspends itself by the tail, and, by swinging its body, reaches the boughs of neighbouring trees; it hunts eagerly after birds and their nests; when pursued and overtaken, it will feign death, and I am informed will bear much torture without evincing the slightest sign of life upon these occasions. It is extremely tenacious of life. The female Opossum brings forth from twelve to sixteen young at a time; her nest, which is formed of dry grass, is usually deposited at the root of a tree, or in some close bush. At the time of their birth, the young are described as being scarcely more than a grain in weight, blind, naked, and shapeless; nevertheless they find the teats in the pouch of the parent, to which they attach themselves so firmly that they cannot be separated without difficulty. When the young have attained the size of a mouse, and all their parts are developed, which takes place in about five days, they then leave the pouch, but return to suckle, and when danger threatens. During this time the female shows an excessive attachment to her young, and will suffer any torture rather than permit the pouch to be opened. The flesh of the Opossum is said to be well flavoured, resembling that of a sucking pig. The skin is very fœtid. The hair is dyed by the Indians, and woven into girdles, &c.

DIDELPHYS AZARÆ.

Azara's Opossum.

(*Plate* 18, fig. 2).

Didelphis Azaræ.	TEMMINCK, Monogr. de Mammalogie, tom. i. p. 30.
" "	WATERHOUSE, Nat. Library (Marsupialia), vol. xi. p. 83, Pl. 1.
" *aurita.*	PR. MAXIM, Beitr. ii. 392.
Micouré premier.	AZARA, Quad. de Paraguay, i. p. 244.

Fur long and loose, suffused with black; head white, with a central black streak running backwards from the forehead, and a streak on each side running through the eye; ears white, more or less clouded with black at the base; legs and feet black; basal half of the naked portion of tail also black, the terminal half white: very long white hairs are interspersed with those of the ordinary fur on the body.

Inhabits Brazil, Paraguay, Bolivia, &c.

Didelphys Azaræ greatly resembles the Common Opossum of North America, but may be distinguished by the three distinct black marks on the head, and by its longer tail. The head and neck are white; the mesial black stripe commences between the eyes, and is at first narrow, but as it approaches the back part of the head it becomes broader, and on the occiput it is much dilated; the lateral stripe commences considerably in front of the eye, and encloses the eye as it passes backwards almost to the ear; this latter is tolerably large, ovate, and sometimes entirely white, but usually clouded with black at the base. The bristly hairs of the moustaches are very long; those nearest the mouth are white, and the remainder are black; a few similar long bristly hairs spring from above the eye, and there is a small tuft of long hairs on the cheeks The throat and chest are yellowish, or

sometimes rusty brown. The fur on other parts of the body is of a dirty yellowish white hue next the skin, and more or less suffused with sooty black externally; on the back very little of the pale colour is perceptible, but on the sides and under parts of the body the black is less extended on each hair, and the pale hue is seen when the fur is in its ordinary position—most so, on the under parts of the body. The visible portions of the very long interspersed hairs, which are abundant on the back and sides of the body, are pure white. The legs and feet are sooty black. About one-third of the tail is clothed with fur like that on the body; on the remaining portion there are but minute scattered hairs springing from the interstices of the small scales, with which this part of the tail is covered; both the scales and the small hairs are black on the second third of the tail, and white on the terminal third.

	Inches.	Lines.
Length from tip of nose to root of tail ...	19	0
" of tail	19	0
" from nose to ear	4	3
" of ear	1	9
" of fore foot	1	11
" of hind foot	2	6

A specimen of the *D. Azaræ*, brought by Mr. Darwin from Maldonado, La Plata, measured seventeen inches in length from the tip of the nose to the root of the tail, and its tail was about thirteen and a half inches in length. These admeasurements slightly exceed those given by M. Temminck, which are as follows:—

	Adult, Female.		Male.		Male.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Head and body	16	3	14	7	14	0
Tail	14	7	13	6	13	0

Azara's Opossum has a wide geographical range. It was first noticed by Azara in Paraguay; in the British Museum collection are specimens from Brazil, and St. Fé de Bogota. Mr. Darwin found it at Maldonado, and Mr. Bridges has forwarded us specimens from Bolivia. In Guiana it is replaced by a nearly allied species, which we shall next describe—the *D. cancrivora*. The *Didelphys Azaræ* is a nocturnal animal, lies concealed during the day in burrows in the ground, or in thickets, and climbs trees in the night to feed upon fruits, and birds' eggs. Like the Weasel it sucks the blood of birds, and is very destructive to poultry. Azara states that it is found in the open parts of the country as well as in the thickets. The body of this animal, Mr. Darwin informs us, has a very offensive odour after death. Mr. Bridges found eight young ones in a litter of one of these animals.

Didelphys albiventris.

Didelphys albiventris. Lund, Det. K. Danske Vidensk. Selsk. Afh. viii. p. 236.

Fur of a pale Isabella-yellow colour, but with the hairs black at the point on the back and sides of the body: head with a longitudinal black mark running through each eye, and a third dark mark on the forehead; ears grey at the base, and whitish at the point; legs and feet black; tail with the basal half black, and the terminal half pale Isabella-yellow.

Inhabits Brazil.

The above description is taken from Dr. Lund's account of a species of *Didelphys*, which that author regards as distinct from others with which he is acquainted. I strongly

suspect, however, it will prove to be specifically identical with the *D. Azaræ*. It is said to be 22 inches in total length, of which the body constitutes one-half; the ears are 2¼ inches in length. Compared with the *Did. Virginiana*, Dr. Lund observes, it differs in being of smaller size, in having the tail longer, the ears larger, and the abdomen white.

DIDELPHYS CANCRIVORA.

The Crab-eating Opossum.

Didelphis cancrivora. Gmel. Linn. Syst. i. p. 108, sp. 7.
" *marsupialis.* Id. p. 105, sp. 1.
" *cancrivora.* Temminck, Monogr. de Mammalogie, tom. i. p. 32, Pl. 5—skeleton.

Fur long, loose, and rather glossy, of a dirty yellowish white colour next the skin, but with the visible portions of the hairs of a black or brown-black colour, and this dark hue is nearly uniform on all parts of the body: ears black; tail also black, with the exception of the apical half, which is white, or nearly so.

Inhabits chiefly the northern parts of South America.

The nearly uniform dark hue of this animal at once distinguishes it from the other large species of *Didelphys*, to which it is nearly allied, such as the *D. Virginiana* and *D. Azaræ*. In these two species the long hairs of the fur are white, whilst in *D. cancrivora* they are black—at least the visible portions of these hairs, for they are whitish at the root. In size the Crab-eating Opossum is rather inferior to the Common Opossum of North America, and its tail is proportionately longer than in that animal.

The following description is drawn up from specimens of *D. cancrivora* contained in the collection of the British Museum.

	Female.		Male?		Male.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	17	0	14	0	15	2
" of tail, about	15	0	13	0	16	3
" from nose to ear	3	8	2	7	3	6
" of ear	1	3	1	3		
" of fore foot and nails	1	7	1	6	1	6
" of hind foot and nails	2	3	1	11	2	2
" of inner toe of ditto, about ...				7		
" of skull	3	10*			3	9½
" of ditto from hinder root of zygoma to apex of intermaxillary bones ...	3	4½			3	5
Width of ditto	1	10½			1	10¾
Length of nasal bones	1	10			1	9½
Width of ditto towards the hinder part ...		6½				
" " in front		3				
Length of palate	2	4			2	2½
Width of ditto between the hindermost molars		9½				9
Length of posterior palatine openings† ...		6				5
" of four upper true molar teeth taken together		9¼				9¾
" of lower jaw	3	0½			3	1
Height of ditto from apex of coronoid process	1	4½			1	1

The fur is glossy, rather harsh to the touch, and by no means dense; on all parts of the body it is long, but on

* Allowance being made for a small portion which is lost, the skull being fractured behind.

† These openings are long and narrow, and situated partly in the palatine portion of the superior maxillary bones, and partly in the palatines; in these latter bones are four other openings of about $\frac{1}{12}$ of an inch in diameter; they are all nearly in the same transverse line, and near the termination of the palate.

the back it is very long, the longest hairs being as much as three inches in length. The general hue of these animals is sooty black, but the hairs are of a dirty yellow-white hue next the skin, and this pale colour is not altogether hidden by the long black points of the hairs: on the under parts of the body, where there are but few of the coarser and longer hairs, the colour may be described as yellowish white, suffused with black; and on the throat a rusty hue is visible: the tip of the muzzle is brown; the ears are black. About one-fourth of the tail is clothed with fur like that on the body; the remaining portion is curved with small scales, between which spring very minute hairs; the first half of the scaly portion of the tail is black, and the apical half is white.

I have given the dimensions of two specimens alluded to as I find them, but the admeasurements in the third column are more to be depended upon, since they were taken by M. Temminck from a specimen preserved in spirits, whilst the others are from skins. I have added, also, in the third column, the dimensions of a skull taken from Temminck's figure. The author just mentioned states that in upwards of thirty specimens of *D. cancrivora* which had come under his notice, the only variation in colouring which he perceived was, that some specimens had the free points of the hairs of the fur perfectly black, whilst in others they were of a blackish chestnut hue.

The Crab-eating Opossum extends into Brazil, but is chiefly found in Guiana; like its congeners, it climbs trees, and it is said to be a bad runner. It prefers swampy situations where small crabs abound, these forming its food, which consists likewise of small birds, reptiles, and insects. The Indians eat its flesh, which is said to resemble in flavour that of the Hare.

DIDELPHYS CALIFORNICA.

Californian Opossum.

Didelphis Californica. BENNETT, Proceedings of the Zoological Society for March, 1833, p. 40.
? " *pruinosa.* WAGNER, in Wiegmann's Archiv. 1842, p. 358.

Fur long, somewhat woolly, and with very long interspersed harsher hairs; next the skin the hairs are dirty white, but externally those of the ordinary fur are black, or brown-black, and the longer hairs are white; head brown, with a darker mark running through the eye, and a white band immediately beneath this: ears black; tail with nearly the whole of the scaly portion white: legs and feet brown-black.

This species agrees with the *Did. virginiana* and *D. Azaræ* in having the long bristly hairs on the upper parts of the body of a white colour; but it differs from both those animals in having the upper surface of the head of a nearly uniform dusky brown hue; the mesial portion of the head is rather darker than other parts, if we except the black mark, which, commencing considerably in front of the eye, extends backwards to the ear. From both the animals mentioned the present species differs, moreover, in having the ears entirely black: as in the other large species of Opossums just described, the fur is of a dirty yellowish white colour next the skin, and this pale hue is not perfectly hidden by the overlaying dark points of the hairs; indeed, on the abdomen the pale colour is but little concealed. The somewhat bristly, long, interspersed white hairs, are exceedingly abundant on the back of the animal. The root of the tail is clothed with

fur, like that on the body; the remaining portions are scaly, at first black, but the greater part appears to have been white in the living animal.

	Inches.	Lines.
Length of head and body, together	17	0
" of tail	14	0
" from nose to ear	3	11
" of fore foot	1	8
" of hind foot	2	1
" of ear	1	5

Two specimens of the present species were obtained by the Zoological Society, from that part of California which adjoins to Mexico; and it is upon these that Mr. Bennett's description was drawn up.

Didelphys pruinosa. WAGNER.

The colouring of the fur of the animal described by Dr. Wagner, under the above name, can scarcely leave a doubt but that it is specifically identical either with the *D. californica* or the *D. breviceps;* but, unfortunately, the skin upon which Dr. Wagner founds his species had had the skull removed before it came into his possession; hence the proportions of the head could not be ascertained with any degree of accuracy. I have been induced, however, to associate the *D. pruinosa* with the *D. californica*, rather than the *D. breviceps*, from the circumstance of its agreeing with the former in having the ears totally black. The length of the tail in *D. pruinosa* is said to be about equal to that of the head and body, taken together, which is about one foot. The ears are nearly an inch and a half in length.—It is from Mexico.

DIDELPHYS BREVICEPS.

Short-headed Opossum.

Didelphis breviceps. BENNETT, Proceedings of the Zoological Society for March, 1833, p. 40.

Head short; fur long and somewhat woolly, whitish next the skin, and black externally; upper parts and sides of the body with very long interspersed white hairs; head with the upper surface brown, a black mark running through the eye, and extending to the ear, and a white mark immediately below this: ears black, but mottled with white at the point: tail with the scaly portion at first black, but with the apical part white: legs and feet black.

Inhabits California.

The specific name given by Mr. Bennett to this animal, calls attention to its chief distinguishing character, as compared with either of the foregoing species. In its colouring it can scarcely be said to differ from the *D. californica*. The long bristly hairs on the upper parts of the body are remarkably abundant, and many of them measure as much as three and a half inches in length It was obtained from the same part of California as the preceding species.

	Inches.	Lines.
Length of head and body	14	0
" of tail	12	0
" from nose to ear	3	2
" of ear	1	1
" of fore foot	1	6
" hind foot	2	0

Besides the foregoing species, belonging to the first divi-

sion of the Opossums in which the pouch is well developed, the British Museum Collection contains two specimens of an animal which resembles the *Didelphys cancrivora* in having the body and limbs almost of an uniform black colour, but which, like the *D. Azaræ*, has a white head adorned with three black marks, one of which commences in a point between the eyes, and runs backwards on to the occiput, where it is much expanded; of the others, one is placed on each side of the head, commencing on the muzzle, and running back to the ear; they inclose the eye, as in *D. Azaræ*. From this species they differ, not only in having the body black, but in having the ears uniformly white. The tail is black at the base, and has the apical half white. The fur is white next the skin, or nearly so, as usual, and on the sides and under parts of the body the pale parts of the hairs are not altogether hidden by the overlapping points. In size these animals nearly agree with the *D. cancrivora*.

	MALE.	
	Inches.	Lines.
Length of head and body, together	15	6
" of tail	15	0
" from nose to ear	3	2
" of ear	1	2
" of fore foot	1	5
" of hind foot	2	0

It is not known from what part of America these specimens were procured.

The following species of Opossums are of smaller size, and of a more slender form, than those already described: they differ, moreover, in having the fur short, and destitute of the long bristly interspersed hairs.

DIDELPHYS QUICA.

Quica Opossum.

Didelphys Quica. (NATTERER) TEMMINCK, Monographies de Mammalogie, tom. i. p. 36. 1827.
" " DESMAREST, Dict. des Sci. Nat. tom. xlvii. p. 387.
" " WAGNER, in Schreber's Saugethière Suppl. 109—110 Heft, p. 42.

Fur short, dense, and rather harsh to the touch; general hue of the upper parts and sides of the body ashy grey, indistinctly pencilled with silvery white, and, on the back, somewhat suffused with black; under parts white: head, on the upper surface of a sooty black hue, but with two largish white spots, situated rather behind the line of the eyes: ears large, oval, and of a brown hue: tail about equal in length to the head and body taken together; blackish, excepting at the extremity, which is white; about two inches of the basal portion clothed with fur.

Female with the upper parts of the body of a dusky brown colour.

Inhabits Brazil, Guiana, and Surinam.

Three male specimens of the *D. Quica* in the British Museum collection can be scarcely said to vary in their colouring or size. Their fur is dense, rather harsh to the touch, and by no means closely applied to the skin; it averages at about a quarter of an inch in length. On the upper parts and sides of the body the hairs are grey at the root, of a glistening silvery white near the point, and dusky at the point, and the general hue produced may be described as ashy grey, slightly suffused with blackish, and having at the same time a very faint purple tint. On the sides of the

body the black is less extended on each hair, and hence these parts are paler. The whole upper surface of the head is sooty black, with the exception of two largish white spots on the forehead, which are separated from each other by a space of a quarter of an inch in width; a small rusty spot is observable near the anterior angle of the ear, and immediately in front of the ear-opening the fur is pale grey or whitish. The upper lip, lower part of the cheeks, and the whole of the under parts of the body, are white, or cream-coloured; and so are likewise the inner side of the hind and fore legs, and the hinder part of the latter; the outer surface of the legs, and the upper surface of the feet, are grey. The ears are large, of an oval form, and apparently were of a darkish brown colour in the living animal, but paler at the root. The tail is about equal to the head and body in length, thick at the root, where it is clothed with fur like that on the body; at about two inches from the root the fur terminates, and the remaining portion is scaly; at first, of a dusky brown colour, but the apical portion is white, and usually the white extends back about four or five inches from the point.

The female of *D. Quica* I have not seen, but it is said to differ somewhat in its colouring from the male M. Temminck describes it as of a blackish fawn colour, with a slight silvery hue; the flanks and limbs of a bright ash-colour, and on the abdomen and region of the pouch of a rusty hue: the head and muzzle black or blackish on the upper surface, and with three large, white or whitish spots, on each side—one above, one beneath, and one behind each eye.

The fur of the young is said to be more tinted with fawn colour, or with brown, than the adult.

The subjoined dimensions are from two male specimens.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	12	0	14	0
" of tail	11	6	13	6
" from nose to ear	2	6	2	8
" of ear	1	1½	1	0
" *of fore foot*	1	2	1	2
" of hind foot	1	7	1	6½
" of skull	2	8½		
Width of ditto	1	5½		
" *between orbits*		6		
" in the temporal region ...		4½		
Length of nasal bones	1	4		
With of ditto towards the hinder part		4		
" in front		2		
Length of palate	1	7		
" of four true molar teeth taken together		7		
" of lower jaw	2	2		
Height of ditto from apex of coronoid process		10		

The Quica, as this animal is called by the natives of Brazil, is found in the Surinam district, and, no doubt, in other parts of Guiana, but appears to be most abundant in Brazil. It lives upon trees, and feeds upon small birds, insects, and fruits. During the day-time, like others of its group, it sleeps, having its body then rolled into a ball.

DIDELPHYS NUDICAUDATA.

Naked-tailed Opossum.

Didelphis nudicaudata. (Geoffroy), Desmarest, Nouv. Dict. Hist. Nat. tom. ix. p. 424.—Mammologie, p. 257.
" *myosuros* Temminck, Monogr. de Mammal. p. 48.

General hue brownish yellow, or sienna-yellow, brightest on the sides of the neck, and somewhat suffused with blackish on the back; under parts yellowish white; head dusky above,

and with two small white spots on the forehead: tail with the fur less extended on the basal portion than usual, about half an inch only being clothed.

Inhabits Brazil and Guiana.

This species is nearly allied to the *D. Quica* and the *D. Opossum*, but in both those animals fur like that of the body is extended for at least two inches on to the root of the tail, whereas in the present species not more than half an inch of the tail is clothed with fur. Its feet are rather longer than in *D. Quica*. The fur is very short, and dense; its prevailing hue on the back of the animal is brownish, but it is slightly pencilled with white; on the sides of the body the fur assumes a brighter hue, being suffused with sienna yellow—most distinctly so on the sides of the neck; the under parts of the body are white or cream-colour, but here and there tinted with yellow. The upper surface of the head, and the sides of the muzzle, are brownish black; the upper part of the latter is brown; on the forehead are two small white spots, which are separated from each other by a space of about half an inch in width[1]. A small rusty yellow spot is observed near the anterior angle of the ear; the hairs near the ear-opening are dusky: the cheeks are yellowish white, and so are the chin and throat. The ears are large, ovate, and of a brownish colour. The hairs of the moustaches are black. The limbs are coloured externally like the sides of the body; internally they are white, or nearly so. The tail is about equal in length to that of the head and body taken together, and of a brown colour, excepting the apical portion, which is white; the white occupies as much as five inches of the tail, but often is less extended.

[1] The large pale spots on the forehead of *D. Quica* have a dark space between them of not more than a quarter of an inch in width, in the full-grown animal.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	12	6	13	0
" of tail	13	6	12	6
" from nose to ear	2	5	2	4
" of ear	1	0	1	0
" of fore foot	1	3		
" of hind foot	1	10	1	10½
Length of skull, about	2	6		
" from posterior root of zygomatic arch to apex of intermaxillaries	2	1⅓		
Width	1	3		
" between orbits		6½		
" in temporal region		4⅓		
Length of nasal bones	1	2⅓		
Width of ditto towards the hinder part		4¾		
" in front		2¼		
Length of palate	1	4½		
Width of ditto between the hindermost molars		6½		
Length of four upper true molars taken together		6		
" of lower jaw	1	10½		
Height of ditto, from apex of coronoid process, about		9		

The skull from which the above dimensions are taken has been removed from the skin of an adult male animal, and, compared with a skull of the *D. Quica,* also belonging to an adult male, differs in being considerably smaller, and in having the nasal bones more expanded behind. The palate in *D. Quica* has two longish palato-maxillary openings, and four other openings behind these, placed nearly in the same transverse line: the middle two are rather longer than broad, the breadth being about one line. In *D. nudicaudata* there are but two of the four openings just alluded to, the middle pair being absent; and the palato-maxillary openings are considerably smaller. The foremost upper premolar, moreover, in this animal, is placed nearer to the second premolar than in *D. Quica*, the muzzle being rather less elongated.

The Naked-tailed Opossum is said to be very abundant in Brazil; and, according to M. Temminck, is found also in Guiana, but is rarely received from Surinam.

DIDELPHYS OPOSSUM.

Four-spotted Opossum.

Didelphis Opossum.		LINN., Syst. Ed. xii. vol. i. p. 72.
"	"	SCHREB., Säug. iii. p. 537, Tab. 146 A and B.
"	"	TEMM., Monogr. de Mamm. tom. i. p. 41.
"	"	WAGNER, SCHREB., Säug. Suppl. iii. p. 44.

Fur short; general colour rusty yellow; the lower part of the cheeks, and the whole under parts of the animal, yellowish white; head with two large white spots on the forehead, and with two similar white spots, placed one behind each ear: ears naked, oval; tail as long as the body, or rather longer; the fur of the basal portion considerably extended; the naked portion at first brown, but terminated with white.

Inhabits Guiana and Brazil.

In size this animal rather exceeds the Common Squirrel; the fur on the upper parts of the head and body, as well as that which covers the base of the tail, is of a rusty red, or reddish cinnamon colour; less pure on the lower parts of the limbs; above each eye is a large whitish spot, and a similar spot is placed behind each ear; the lower part of the cheeks is also whitish; the eye is encircled with the same rusty red hue as that on the back; the whole of the under parts of the body, as well as the inner sides of the limbs, are yellowish white: the naked portion of the tail is for the most part brown, but the apex is whitish. The female is larger than the male.

	Male. Inches.	Male. Lines.	Female. Inches.	Female. Lines.
Length from tip of nose to root of tail	10	3	10	3
" of tail	9	2	10	3
" of hairy portion of ditto ...	2	2	2	3
Width of the tail at the root ...	1	7		
From tip of nose to eye ..	1	1	1	3

The above account is taken from Temminck, who moreover states that the skull of the *D. Opossum* greatly resembles that of *D. Quica*, but that in the former animal the upper surface of the cranium forms a straight and descending line, whilst in *D. Quica* the central portion of the skull is elevated.

The Four-spotted Opossum[1] is very common in Guiana, and is found also in Brazil, but apparently in less abundance in the last mentioned district.

[1] The French call this animal *Le Didelphe Quatre-œil*, the conspicuons white spots on the forehead being compared to a second pair of eyes. I have applied the English name, Four-spotted, on account of there being two pairs of spots on the head ; the second pair are wanting, or scarcely traceable, in the other Opossums, which, like the present species, have spots above the eyes.

DIDELPHYS PHILANDER.

The Philander Opossum.

Didelphis Philander.	LINN. Syst. i. p. 72, sp. 2. 1766.
" "	SHREB. Säug. vol. iii. p. 541, Pl. 147. 1778.
" "	TEMM. Monog. de Mammal. vol. i. p. 43, 1827, Pl. 6 (skeleton).
" "	WAGNER, SHREB., Säug. Suppl. vol. iii. p. 45. 1842.
" *Cayopollin.*	DESM. Nouv. Dict. d'Hist. Nat. tom. ix. p. 147, 1817. Mammalogie, p. 257. 1820.
Philander Marsupialis[1].	GRAY, List of Mammal. in British Museum, 1843, p. 101.

Upper parts of body of a yellowish rust colour (ashy grey, suffused with rusty yellow, in the female) ; under parts yellow ; upper surface of head pale silvery grey, but with a slender, dusky, longitudinal mark ; region of the eye dusky, and this tint extended considerably in front of the eye : tail with about one-fifth of its length clothed with fur like that on the body ; the remaining, scaly portion, at first brown, then clouded, or spotted with brown and yellowish white, and entirely of the latter hue at the distal extremity. Ribs very broad.

Inhabits northern parts of South America.

[1] With respect to the *Didelphis marsupialis* of the older authors, there can be no doubt that the descriptions and figures generally refer to one or other of the large species allied to the *Didelphis Virginiana*, or to that animal. Linnæus refers to Seba's plate and description as his *D. marsupialis*, and that plate, &c. is clearly taken from the animal called *D. cancrivora* by modern authors, though Linnæus notices in his description that the ears are black tipped with white—a character found in the *D. Virginiana*, but, to my experience, never found in *D. cancrivora*. I find no notice in Seba's account of the ears being tipped with white. The *D. marsupialis*, according to Schreber's description, must be the *D. cancrivora* of Temminck, but his figure, although copied from Saba's, it would appear is coloured from one of the Opossums belonging to the second division. On the whole, as there appears to be more than one species con-

This species agrees very closely in size with the *D. Quica*, *D. nudicaudata*, and *D. Opossum*, but may readily be distinguished by its short head, and the absence of the white spots on the forehead: on this part is a narrow, dusky longitudinal mark, which runs forwards nearly to the end of the muzzle, and is rendered conspicuous by the parts of the head immediately adjoining it, on either side, being of a silvery grey hue. The region of the eye is dusky brown, and this dark colour is much extended in front of the eye. The upper lip is edged with whitish, and the cheek is yellow. The hinder portion of the head and upper parts of the body are of a yellowish rust colour, and the sides of the body and outer side of the limbs are rusty yellow; the limbs are, however, somewhat tinted with grey, the pale grey of the fur next the skin not being altogether hidden by the brighter coloured points of the hairs on these parts, and the sides of the body near the limbs is of a brighter hue than elsewhere, assuming a golden yellow tint: the same rich yellow is observed on the sides of the neck: the fur covering the basal portion of the tail differs from that of the body only in being of a less bright tint. The whole of the under parts of the animal, as well as the inner surface of the legs, is of a bright yellow hue. The feet are sparingly clothed with pale hairs. The naked portion of the tail is at first brown; it is then spotted, or clouded with brown and yellowish white, and at the extremity, and, indeed, for a considerable distance from the point, is entirely yellow-white. The long bristly hairs, which as usual spring from the sides of the muzzle, from above the eye, and from the cheek, are brown.

The above description is taken from a male specimen

founded under the name *D. marsupialis* by Linnæus, I have followed those authors who reject the name altogether.

The term Philander is used by Mr. Gray in a generic sense for nearly all the Opossums in which the fur is short, and destitute of long bristly hairs.

preserved in the National Collection; this specimen is stuffed, and, unfortunately, has lost its ears. It measures—

	Inches.	Lines.
From tip of nose to root of tail	14	0
Tail, about	14	0
Of which the hairy portion is	3	0
From nose to ear	2	3
Fore foot	1	1
Hind foot	1	8

In the same collection are some specimens of the *D. Opossum*, together with a second male Philander, which, being preserved in spirits, affords us a favourable opportunity of comparing the proportions of the two animals. The most striking difference which presented itself upon laying the two species side by side, was that observable, as already noticed, in the porportions of the head. With the body but one-third of an inch longer in *D. Opossum* than in *D. Philander*, the head was nearly three-quarters of an inch longer. Other differences were more or less marked: thus the tail of the *D. Opossum* was considerably shorter and thicker than in the *Philander*, and differed, moreover, in having the scales larger, and consequently more distinct: when the limbs are compared, the proportions of length and thickness are reversed in the two animals, the legs being shorter and stouter in the Philander than in the *D. Opossum*[1]. In the latter animal the vertical groove on the naked muffle is moderately indented, and, besides the notch formed by the termination of this groove on the lower edge of the muffle, there are two other notches, one on each side of the mesial indentation. In *D. Philander* the nasal groove is more deeply impressed, and there are two distinct notches on either

[1] Judging from stuffed specimens, the shorter and thicker legs will also distinguish the *D. Philander* from the *D. nudicaudata* and the *D. Quica*.

side. The extremity of the tongue, as in others of the genus, is fringed with sharply-pointed fleshy tubercles; in *D. Opossum* I could perceive but one distinct row[1] of these tubercles, whilst in *D. Philander* there were several rows. The subjoined dimensions were taken from the two animals above alluded to. I regret it has not been in my power to compare individuals of the same sex.

	D. Opossum. Female. Inches.	Lines.	*D. Philander.* Male. Inches.	Lines.
Length from tip of nose to root of tail	11	0	10	0
" of tail	10	0	12	6
" of hairy portion of ditto ...	1	2	2	0
Diameter of ditto at the root ...		7½		6
Length from tip of nose to ear ...	2	7	1	11
" from ditto to eye	1	3½		10½
" of ear	1	1½	1	2
Width of ditto	1	0		11
Length of fore leg, from tip of elbow to the wrist	2	2	1	9
" of fore foot		11½		11
" of hind leg, from the knee to the ankle	2	7½	2	1
" of hind foot	1	7	1	4

Schreber's description of *D. Philander* agrees so closely in all essential points with the two specimens from which my account is taken, that I cannot doubt their being the same animal; and moreover I cannot but think my *D. Philander* is specifically identical with the animal figured by Seba, and which is referred to by Linnæus as his *D. Philander*[2]. M. Temminck's description of the male Philander

[1] This row of tubercles edges the tongue; behind it were some others, but these could only be perceived with a strong lens: the difference consisted in the tubercles forming the hinder rows in *D. Philander* being more developed.

[2] See Seba's *Locupletissimi Rerum Naturalium Thesauri accurata descriptio*, tom. i. Plate 36, fig. 4. Seba states in his text (p. 57) that the female animal described by him has no pouch. Schreber describes the Philander

agrees perfectly, as regards the colouring, with the specimen described by myself, excepting that in that individual the under parts of the body are yellow, whilst the author just mentioned states that they are white in the specimens which he examined. The specimen preserved in spirit, of which I have given the dimensions, agrees more nearly with M. Temminck's account in this respect, the abdomen being nearly white. These male specimens, on the other hand, differ much from those noticed by M. Temminck, with regard to size; that author gives thirteen and a half inches (French measure) as the total length of three male specimens in his possession, of which, he states, the tail measured eight and a half inches, and the head one inch and ten lines[1].

The female Philander differs from the male in being less bright in its colouring; it has the same narrow dusky mark on the forehead, bordered on either side by pale grey, or whitish, and the tail spotted in parts with brown on a whitish ground colour, but the upper parts of the body are ashy grey, slightly suffused with rusty yellow; the under parts are yellowish white, and so are the cheeks and inner side of the limbs.

According to Schreber and Temminck, the Philander Opossum inhabits Surinam; the last mentioned of these authors states that he had never seen specimens in collections

as possessing a pouch, but his observations tend to show that it is more open than in the species hitherto described. Temminck states that the pouch is perfect in the female Philander. I cannot put much faith in Seba's statement, since I do not find his descriptions by any means remarkable for accuracy or precision: he appears, as Schreber remarks, to have drawn up his descriptions chiefly from his plates.

[1] The head and body, taken together, would then be only five French inches, and yet one inch and ten lines is given as the length of the head, thus making it more than one-third of the length of the trunk. If these dimensions be correct, the *D. Philander* of Temminck would have a head larger in proportion to the body than the *D. Opossum*, whilst his description states that it is remarkable for the shortness of its head.

formed in Brazil. In the stomachs of specimens dissected, the remains of birds have been found.

	Specimen in Mus. Zool. Soc.		From Temminck		Brit. Mus.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	9	0	9	9	10	6
" of tail	13	0	14	0	13	6
" of hairy portion of ditto	2	9	2	11	2	2
" from nose to ear	1	9			2	0
" of ear		10				9

Didelphys dichura.

Didelphys dichura. **(NATTERER), WAGNER, in Wiegmann's Archiv. fur Naturgeschichte, vol. viii. Pt. 6 for 1842, p. 358.**

General tint reddish grey; under parts yellowish white; tail equal to the body in length, and of a whitish flesh-colour, spotted with brown above, and immaculate beneath. Length of head and body 8½ inches; of tail, 9 inches.

Inhabits Brazil.

Dr. Wagner observes, that both *D. dichura* and *D. affinis* are liable to be confounded with the *Did. Philander*, and that the diagnosis of the last mentioned species might be as follows:—above, reddish, or hoary grey; beneath, yellow white; tail much longer than the body, the naked portion at first brown, and then white, spotted both above and below with brown, and with a considerable portion at the terminal extremity of an immaculate fleshy white tint; female with a distinct pouch. Length of head and body, 11 inches and 2 lines; tail, 15 inches, of which the hairy portion measures 2¾ inches.

Section II. *Opossums in which the pouch is rudimentary, or entirely wanting.*

Didelphys affinis.

Didelphys affinis. (NATTERER) WAGNER, in Wiegmann's Archiv. fur Naturgesch. vol. viii. Pt. 6 for 1842, p. 358.

General tint reddish; under parts yellowish white; tail longer than the body, spotted with white, both above and beneath; pouch wanting. Length of head and body 9 inches; of tail, 10 inches.

Inhabits Brazil (Matto grosso).

DIDELPHYS DERBIANUS.

Derby's Opossum.

Didelphys Derbiana. WATERHOUSE, Naturalist's Library (Marsupialia), vol. xi. p. 97, Pl. 2. Aug. 1841.

Body stout; tail considerably longer than the head and body taken together, and covered with fur for more than one-third of its length; fur of moderate length; general colour bright brownish rust; under parts dirty white; head greyish, and with a longitudinal dusky line above; lower half of fore legs white; hind feet dusky; naked portion of tail of a pale tint, but spotted with dark brown; a short silvery-grey stripe along the back.

Inhabits —— ?[1]

In having a dark mark on the head, and the naked portion

[1] Dr. Schinz states that Dr. Tschudy, in a recently published account of Peru, has described a species of Opossum, under the name *bicolor*: the work in question has not yet found its way into our National Library, and I have not been able to procure it.

of the tail spotted, this species agrees with the *D. Philander*, but it is readily distinguished from that, and other species, by the great extent of the tail, which is clothed with fur, combined with the silvery grey stripe on the back, the white fore legs, and the dusky hue of the hind feet. Its body seems to have been, moreover, considerably stouter than in other species of the short-furred section. The upper parts, and sides of the body, as well as the outer surface of the hind legs, are of a bright, brownish rust colour, and the under parts of the head and body are dirty white. The general tint of the head is brownish grey; a faint brown streak runs along the upper surface, commencing near the extremity of the muzzle, and terminating in a line with the anterior portion of the ears, and near this dark line the fur is of a purer and paler grey than on other parts of the head; the region of the eye is brown; the edge of the upper lip is white: the ears are tolerably large, naked, and of a pale colour, as are also the naked soles of the feet. The grey stripe on the back commences in a line with the shoulders, and terminates about midway between that point and the root of the tail; a second pale grey mark runs upwards on the side of the body, immediately behind the fore leg, and a third grey mark is observable on the outer surface of the hind leg, running obliquely upwards and backwards from the knee. The lower half of the fore leg is white, and the scanty hairs which cover the upper surface of the foot are also white; the hind feet are dusky. The fur covering the basal portion of the tail is of a dull brown colour, excepting on the under surface, where it is dirty white, and it is paler on the upper surface at the root than on other upper parts: the naked portion of the tail is of a pale pinkish hue, but is spotted with dark brown; the spots are numerous near the hairy portion, and gradually decrease in number as they become more remote from that part.

		Inches.	Lines.
Length from tip of nose to root of tail	...	13	6
" of tail, about	...	17	0
" of hairy portion of ditto ...	...	7	6[1]
" from nose to ear	...	2	6
" from ditto to eye	...	1	1
" of ear	...	1	2
Breadth of ditto	...		11
Length of hind foot	...	1	9

I have seen but one specimen of this species, and that forms part of the collection of the Earl of Derby, after whom I have taken the liberty of naming it. In my notes (made some years ago) I omitted to notice the sex, and cannot therefore state whether it possessed a pouch. Its habitat is unknown.

DIDELPHYS LANIGERA.

Woolly Opossum.

Didelphis lanigera. DESM., Mammalogie, Pt. 1, p. 258, sp. 395.
" " RENGGER, Naturgesch. der Säugth. von Paraguay, p. 225. 8vo. Basel, 1830.
Micouré second, ou Micouré laineux. AZARA, Ess. sur l'Hist. Nat. des Quadr. du Paraguay, tom. i. p. 275.

Fur rather long and woolly; prevailing colour bright brown, on the sides of body, and outer sides of limbs, reddish brown; under parts reddish white; head with a narrow longitudinal dusky mark above; tail with the terminal third only, entirely destitute of fur: ears moderate, and of a livid violet tint.

Inhabits Paraguay.

[1] On the under surface of the tail the hair does not extend so far by about an inch and a half.

According to Azara this animal has a soft and woolly fur, which, on the back, is about one inch in length; its general colour is compared to that of Spanish tobacco, deeper on the back, and bright on the sides of the body; the under parts, and inner surface of the legs, whitish. On the head is a narrow brown line, commencing on the muzzle, and running backwards to the occiput. The ears are somewhat pendulous, naked within, and with the terminal half also naked externally; in the living animal they are of a livid violet hue: the edge of the lower lip is white. Fur, like that on the body, covers an unusually large portion of the tail, extending on the upper surface to the commencement of the terminal third part, but on the under surface it is less extended, terminating at the commencement of the second third; the naked portion of the tail is whitish. Both Azara and Rengger agree in stating that the tail has a triangular form, arising, according to the latter author, from the great development of the spinous and transverse processes of its vertebræ.

Three specimens examined by Dr. Rengger are described as of a light brown colour, passing into reddish brown around the eyes, on the sides of the neck, and outer surface of the extremities; as having a black stripe on the upper part of the head, which runs forwards to the point of the nose; the edge of the lower lip white, the bristles on the face black, the point of the muzzle flesh-coloured, the abdomen and inner side of the limbs reddish white, the ears and soles of the feet violet blue mingled with grey, and the naked portion of the tail reddish white.

Both sexes are said to agree in their colouring, and the female has no true pouch, this being represented only by two folds of the integument.

	Azara. Inches.	Azara. Lines.	Rengger. Inches.	Rengger. Lines.
Length from tip of nose to root of tail	8	8	8	10
" of tail	13	6	13	6
" of ear	1	0	1	0
Width of ditto		6	(nearly)	6
Length of head	2	3	2	4

Our English collections do not yet possess this species, nor did I find it in the French National Museum; M. Temminck, moreover, states, in his Monograph on the present genus, that he had never seen the *Micouré laineux* of Azara in any of the collections which he had examined. It approaches most nearly in its characters to the *Did. Derbiana.*

DIDELPHYS CRASSICAUDATA.

Thick-tailed Opossum.

Didelphis crassicaudata. Desm., Nouv. Dict. d'Hist. Nat. tom. ix. p. 425.—Mammalogie, p. 527, sp. 393.
" " Rengger, Nat. der Säugeth. von Paraguay, p. 226.
" " Waterh., Zool. of H.M.S. Beagle—Mammalia, p. 94, Pl. 30. Skull, &c. 25 *a* to *d*.
" *mustelina.* Geoff., Paris Museum.
Micouré troisième, ou *M. à queue grosse.* Azara, Essais sur l'Histoire Nat. des Quad. de la Province de Paraguay, vol. i. p. 284.

Muzzle short and obtuse; ears short, and clothed with small hairs; tail very thick at the base, rather shorter than the head and body taken together, with the basal third clothed with fur like that on the body, the remaining portion with short hairs; fur somewhat harsh, its general colour yellow-brown; under parts of body dirty yellow; the region of the eye, and the muzzle, brownish: tail with the terminal two-

thirds black, with the exception of a smallish space at the end, which is white. Feet short.

Inhabits Brazil and Paraguay, and extends southwards as far as the River Plata.

The *D. crassicaudata* is not only remarkable for the great thickness of its tail, but differs from all the preceding species in having small ears, and these tolerably well clothed with small hairs; its tail, moreover, has the part which is usually naked, or nearly so, almost covered by small semi-adpressed hairs; its feet are very short, and so is its head. The fur of the animal, moreover, is remarkable for being composed chiefly of somewhat harsh hairs, and these pretty closely applied to the body, the under fur being rather scanty. In colouring it varies considerably. A specimen brought home by Mr. Darwin from Maldonado, La Plata, has the upper parts of the head and body of a brown-yellow hue, and the under parts dirty yellow; the muzzle, as well as the space round the eye, is dusky brown; the tip of the chin, and also the tip of the muzzle, on either side, whitish; the cheeks yellow; the small hairs covering the ears on the outer side are brownish, and those on the inner side are yellow, but brown towards the outer margin: about one-third of the tail is clothed with fur like that on the body: beyond this the tail is black, excepting a small portion of about one inch in length at the apex, which is white: these black and white parts of the tail are clothed with hairs which are nearly a quarter of an inch in length (shorter near the point), and are almost sufficiently numerous to hide the scaly skin beneath. The hairs on the back (which are moderately long) are grey next the skin, ochreous yellow towards the point, and yellowish brown at the point: on the under parts of the body they are faintly tinted with grey at the root, and of a dirty yellow colour at the point.

A specimen labelled *Didelphis mustelina* in the French national museum, but evidently belonging to the present species, is almost of an uniform pale yellow tint, but slightly suffused with brown on the back, and on the upper surface of the head; the muzzle is brown, and the same colour surrounds the eye; the lips and chin are whitish; the whole of the under parts of the body are of a straw yellow, the under surface of the neck is somewhat more distinctly tinted with yellow; the fore feet and legs are yellowish white; the hind feet brownish: about three inches of the apical portion of the tail is white; the middle third of the tail is black.

Rengger states that occasionally the prevailing hue of the upper parts of the body in this animal is brown-red[1], and that of the under parts, reddish grey.

	From Azara.							
	Male.		Female.		Male.			
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	13	2	12	4	12	1	11	3
" of tail	12	1	9	7	11	0	10	3
Circumference of ditto at the root	3	10	2	2	2	9		
" of the body immediately behind the fore legs	7	5			5	8		
Length from nose to ear							2	1½
" of ear							1	5½
" of hind foot								6

The dimensions in the fourth column are taken from Mr.

[1] I may observe, that upon separating the fur on the back of the specimen brought home by Mr. Darwin, I perceived that at the time of its death the animal was about to shed its fur, and that the new coat would have been of a reddish hue, for numerous young hairs of this colour were visible.

Darwin's specimen already alluded to: the admeasurements of the cranium of the same specimen are—

	Inches.	Lines.
Total length of skull	2	4
Width	1	3
Length of nasal bones		9½
" of palate	1	2¾
Width of ditto between the posterior molar teeth		5
Distance between fore part of front incisors and fore part of canine tooth ...	2	0¾
" between fore part of canine and hinder part of last molar tooth	1	0
Length of lower jaw	1	10½

This specimen weighed, according to Mr. Darwin, 14½ oz.

Dr. Rengger states that the animal is found throughout Paraguay, but not very abundantly. The specimen in the Paris Museum is labelled as coming from Brazil. A specimen which Azara saw in captivity allowed itself to be handled, although it was adult, and had only been caught a few days previously. He describes it as being very stupid, and in this respect resembling the *D. Azaræ*. It was fed upon raw meat, and a parrot happening to approach, it was captured and killed in a moment by the Opossum. The author just alluded to found six mammæ in a female which he examined; there were two folds of skin on the lower part of the abdomen, but no true pouch.

Didelphys ochropus.

Didelphys ochropus. (Natterer) Wagner, in Wiegmann's Archiv für Naturgesch. vol. viii. Pt. 6 for 1842, p. 539.

All that we learn from Dr. Wagner relating to this species is, that it resembles the *Didelphys lanigera*, but is of smaller

size, of a more rufous tint, has the sides of the head, neck, and body, suffused with hoary grey, and the tail with nearly one-half naked. It inhabits Brazil (Barra).

DIDELPHYS CINEREA.

Ash-coloured Opossum.

Didelphis cinerea. TEMMINCK, Mongraphies de Mammalogie, tom. i. p. 46.
" " PR. MAXIM. Beiträge zur Naturgeschicte Braziliens, ii. p. 406.
" " WAGNER, in Schreber's Säugth. Suppl. iii. p. 47.
" " CUVIER, Règne Animal (1829), p. 177.

Fur short, dense, and of a cotton-like texture; general colour ashy grey, the back slightly suffused with black; under parts impure white; eyes encircled with black; tail with rather more than one-fifth of its length clothed with fur like that on the body, the naked portion at first brown, but with the greater portion white. The female somewhat suffused with rusty yellow.

Inhabits Brazil.

M. Temminck describes this animal as follows:—Size about equal to that of the Black Rat (*Mus Rattus*); head small, muzzle very short; ears somewhat contracted at the base, naked; tail much longer than the head and body taken together, very slender, and well clothed with fur at the base, the remaining portions perfectly naked; the extremity white, the white occupying more than half of the length of the tail. Females destitute of pouch.

The fur is dense, but short, and of a cotton-like texture; in the males it is of an ashy grey colour, but the extreme points of the hairs are suffused with blackish; the under parts of the body, as well as the inner surface of the limbs,

are whitish, and the throat and chest are rusty white; the colouring of the fur on the head and muzzle does not differ from that of the back, and exhibits no trace of a mark on the forehead, or of pale spots above the eyes; the eyes are encircled with black, and the black is most extended in front of the eyes; the tail is covered at the base by a dense fur of the same ashy grey hue as that on the body; the remaining portion is covered by a scaly skin, but the scales are by no *means distinct: this hairless part of the tail is at first* brown, but the greater half, which is the terminal one, is white.

The females have the fur somewhat suffused with rusty yellow, and a yellowish tint is perceptible in the region of the ears, and on the cheeks; the white of the under parts of the body is less pure than in the males; the region of the mammæ, and of the longitudinal abdominal fold of skin, is of a rusty hue; the black band which encircles the eye is less broad, and less defined, than in the males.

	Temminck.				Male, Brit. Mus.	
	Ins.	Lines	Ins.	Lines	Ins.	Lines
Length from nose to root of tail	6	7	7	2	7	6
" of tail	9	10	10	5	9	6
" of hairy portion of ditto	2	2	2	2	1	4
Diameter of ditto at the base						3⅝
From tip of nose to eye		7		7		8½
" " to ear					1	6½
Length of fore leg, from elbow to wrist ...					1	3
" of fore foot						7½
" of hind leg, from knee to ankle ...					1	6
" of hind foot						11½
" of ear						10
Width of ditto						8½
From front of foremost incisor tooth to back of last molar						10¼

I have added to the dimensions given by M. Temminck.

the admeasurements of an animal preserved in spirits in the collection of the British Museum: in all essential points it agrees with M. Temminck's description of *D. cinerea*, having the upper parts of the body grey, and the under parts white, or nearly so, and the eyes encircled with black, but the portion of the tail which is clothed with fur is less than in the specimens examined by the author just mentioned; it is, however, greatly extended, as compared with many of the species of the present section: such as *D. murina*, &c. The muffle in the specimen under consideration has a double cleft on its lower edge, on either side of the notch formed by the termination of the mesial groove, as in *D. Philander*, and I find the same character in *D. murina* and *D. pusilla*. Three very small Opossums accompanied the specimen in the British Museum, which appear to me to be clearly the young of the same species: they agree with the adult in colouring, and upon comparing them with the young of *D. murina* of the same size, they differed in having the tail longer in proportion to the body; the former being 2 inches, and the tail $2\frac{1}{4}$ inches, whilst in *D. murina* the tail was equal to the head and body in length. The scales on the tail of the adult animal are very indistinct.

DIDELPHYS INCANA.

Hoary-grey Opossum.

Didelphis incana. LUND, Det. K. Dauske Vidensk. Selsk. Afh. viii. p. 236.
" " SCHINZ, Synopsis Mammalium, i. p. 503.

Upper parts grey, under parts white; a grey-black band passes through the eye; tail light brown, whitish at the extremity,

and naked to the root. Length of body 4 inches; of tail, 5 inches.

Inhabits Brazil, in the province of Minas Geraes.

This animal, briefly described by Dr. Lund in the Transactions of the Society of Sciences at Copenhagen, it would appear, differs from the *D. cinerea* of Temminck in being of smaller size, and in having the tail destitute of fur at the base: this organ being of two colours, would serve to distinguish the *D. incana* from *D. murina* and *D. dorsigera*, and in the grey colouring of the fur on the upper parts of the body it likewise differs from the two species just mentioned. Whilst, however, there appear to be good grounds for regarding the *D. incana* as distinct from the species alluded to, that animal must, on the other hand, be exceedingly close to, if not identical with, Azara's *Micouré à queue longue*—a species only known to us through description.

DIDELPHYS GRISEA.

Grey Opossum.

Micouré quatrième, ou *M. à queue longue*. Azara, Essais sur l'Hist des Quadr. de la Province du Paraguay, tom. i. p. 290. 1801.
Didelphis grisea. Desmarest, in Dict. des Sciences Naturelles, tom. xlvii. p. 393.

Fur short and soft; general colour mouse-grey; sides of body pale; under parts dirty white; eye encirled with black, and external to this dark ring is a second, which is whitish.

Inhabits Paraguay.

Azara describes this species as having the fur as short and

as soft as that of the Common Mouse, and on the back of the head and upper parts of the body of the same colour as in that animal, but the sides of the body are said to be paler; the under side of the lower jaw, and fore part of the anterior limbs, nearly white, and the under parts of the body dirty white: a narrow dark line on the upper surface of the head separates the pale hue which adjoins the black eye-ring: the tail is of the same colour as the upper parts of the body.

	Inches.	Lines.
Length from tip of nose to root of tail ...	3	11
" of tail	5	4

The *D. grisea* is placed by authors in the pouchless division of the Opossums; but I find that Azara merely surmised that the animal was destitute of that appendage, and had been positively informed by a friend that the female possessed a pouch: perhaps it has a rudimentary pouch, like many of the species of the second section Dr. Lund, in his description of *D. incana*, makes no mention of any pale ring encircling the black one which surrounds the eye, but in other respects his description agrees very closely with Azara's *Micouré à queue longue*.

I will here notice a small species of Opossum contained in the British Museum collection, which will perhaps prove distinct from either of the species briefly characterised by Dr. Wagner, and which appears to me to be undoubtedly distinct from either of the Opossums more fully described by M. Temminck, in his Monograph upon the group.

Didelphys ——— ?

Fur very soft, long and loose; general colour of the upper parts ashy grey, of the under parts white, faintly tinted with

yellow; cheeks, and sides of the neck and body, suffused with yellow; eyes encircled with black, the black much extended in front of the eye: ears naked, of a brown colour, and tolerably large size: tail rather longer than the head and body taken together, with the basal half brown, and the terminal half whitish; about half an inch at the base clothed with fur like that on the body.

In size and general colouring this species approaches the *Didelphys cinerea*, but in that animal the fur is described as short, and of a cotton-like texture, whilst in the present species the hairs of the fur are longer than usual, being more than half an inch in length, and they are less dense. Both on the upper and under parts of the body they are grey next the skin, whilst in most of the small Opossums the fur on the abdomen is uniform in tint throughout. As compared with *D. cinerea*, another point of distinction is presented in the British Museum animal, its tail having a very small space at the root which is clothed with fur—a space of at most half an inch in length, whilst in *D. cinerea* a space of upwards of two inches on the tail (according to Temminck) is clothed with fur.

	Male.	
	Inches.	*Lines.*
Length from tip of nose to root of tail ...	6	9
" of tail	7	3
" from tip of nose to ear	1	6
" of fore foot		8
" of hind ditto	1	0
" of ear		8

DIDELPHYS DORSIGERA.

Merian's Opossum.

Didelphis dorsigera. LINN., Syst. (ed. 12), i. p. 72.
" " SCHREBER, Säugeth. iii. p. 546, tab. 150.
" " TEMMINCK, Monographies de Mammalogie, tom. i. p. 48.

Fur short, and of a grey-brown, or brownish yellow hue, on the upper parts of the animal, and impure white on the hinder parts; eye encircled with dark brown, and this dark tint extended along the sides of the muzzle; the intervening space, as well as the forehead, yellow-white: tail distinctly longer than the head and body together, and of an uniform brown colour; the fur at the base moderately extended.

Inhabits Surinam.

Although the Opossums of the section now under consideration differ from most other Marsupialia in having no pouch, they agree with the animals of their order in that remarkable peculiarity of being comparatively little advanced in development at the time of their birth.

The young, when sufficiently advanced to leave the teats of the parent (to which they are at first firmly attached), are carried by the parent on the back, where they retain their position by means of their prehensile tails, which are entwined round the tail of the mother. It is this habit of carrying the young on the back which gave rise to the name *dorsigera,* applied by Linnæus to the present species; the habit in question being, it was supposed, peculiar to it.

The present species was described as early as the year 1719, by Madame Merian, and is introduced in one of the plates of

her large work upon the insects of Surinam, where it is represented with the young upon the back.

In size the *D. dorsigera* is rather inferior to the common black rat; its fur is short and scanty, and the hairs of which it is composed are of a deep grey colour at the root, and of a grey brown, or brownish yellow tint, at the point, and the general tint resembles that of the common brown rat. The eyes are surrounded by a deep brown ring, which is narrow both above and below the eye, but the dark hue is much extended in front: the forehead is yellowish white, as are also the cheeks, the outer surface of the fore legs, and the feet. The tail is of a uniform brown colour, and perfectly destitute of hairs, excepting at the root.

	Inches.	Lines.
Length from tip of nose to root of tail ...	6	0
" of tail	7	8½
" of hairy portion of ditto	1	0
" from tip of nose to eye		8

DIDELPHYS MURINA.

Murine Opossum.

Didelphis murina.	Linn., Syst. (ed. 12), i. p. 72.
" "	Schreber's Säugeth. iii. p. 545, tab. 149.
" "	Temminck, Monographies de Mammalogie, tom. i. p. 50.
Murine Opossum.	Pennant, Quadr. p. 207.
" "	Shaw, General Zoology, Vol. i. Pt. 2, p. 427.

Fur short and soft, of an ochreous and sometimes rusty yellow hue on the upper parts of the body, and yellow-white on the under parts; eyes surrounded by black, which is much extended in front of the eye; tail rather longer than the head and body together, and of an uniform yellow tint.

Inhabits Guiana, Brazil, Peru, and Mexico.

The short and soft fur on the back of this animal is of a palish grey hue on the upper parts and sides of the body, but the hairs are of a more or less rich yellow hue (sometimes inclining to rusty) at or near the point: on the middle of the back the extreme points are brownish, and the yellow tint is therefore less pure than on the sides of the body, where the hairs are of an ochreous yellow at the point: the grey colour of the basal part of each hair is not altogether hidden by the overlapping yellow points. The outer surface of the limbs is of the same colour as the upper parts of the body. The fur on the under parts of the head and body, as well as the inner surface of the limbs, is uniformly yellowish white to the root. The black ring which surrounds the eye is narrow, both above and beneath that organ, rather broad behind it, and in front is much extended; the mesial portion of the muzzle above, and the forehead, are of a very pale yellow tint. The edge of the upper lip and the cheeks are yellow-white. The ears are brown. The feet are whitish.

	From Temminck.				Paris Museum.		Male. Brit. Mus.		Male. Brit. Mus.		Female. Brit. Mus.		Female, preserved in spirit, Brit. Mus.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length of head and body	5	3	5	4	5	0	5	9	5	9	5	4½	5	4
" of tail	5	9	5	10	6	0	6	6	6	6	5	8	6	0
" of hairy portion of ditto		7		7				5		5		4½		5
" from nose to eye		7		7		7⅓		7						6
" from ditto to ear					1	2	1	2⅓	1	3¼	1	3	1	0½
" of fore leg, from elbow to wrist ...														11
" of fore foot								7		7		6		6
" of hind leg, from knee to ankle ...													1	2
" of hind foot						9¼		9½		10		9		8⅓
" of ear						6½		7		7		6		7½

With the exception of some slight differences which will be seen in the dimensions, and which differences are no doubt partly attributable to the measurements being taken, most of them, from stuffed specimens, the above description

accords perfectly with the "Marmose" (*Didelphys murina*) of the French authors[1], and with four specimens contained in the British Museum collection, one of which is preserved in spirits. These specimens, moreover, accord perfectly with M. Temminck's account of the Murine Opossum; but, on the other hand, they cannot be regarded as the *D. murina* of Dr. Wagner, inasmuch as they have large ears, and these organs are described by that author as small in the animal which he regards as *D. murina*.

The Murine Opossum is found in Brazil, but is apparently most abundant in the northern portions of South America. Among my notes I have a description of a little Opossum, brought from Mexico, which differs only from the *D. murina* in being a trifle smaller: its dimensions were—

	Inches.	Lines.
From tip of nose to root of tail	4	10
Length of tail	5	6
" from nose to ear	1	0
" of ear		6½
" of fore foot		5
" of hind foot		7½

The specimen was a female, and had nine very distinct mammæ. I found the same number in the female *D. murina* which is preserved in spirits in the British Museum

Small as the present animal is, it attacks birds, their feathers being found, mixed with numerous insect remains, in the stomachs of specimens dissected by M. Temminck. The author just mentioned states that it burrows in the ground, and climbs trees, and, like others of the genus, will eat fruits.

Dr. Wagner describes two small species of Brazilian Opossums in Wiegmann's Archiv[2], which he suspects may have been confounded with the *D. murina*. The first—

[1] I have descriptions before me which I drew up from the specimens in the French National Museum.

[2] See vol. viii. (1842), p. 359.

Didelphys macrotarsus,

Dr. Wagner states, resembles the *D. murina*, excepting in having the ears much larger, its tail entirely naked, and of a deep reddish ash colour, and its feet stout and elongated.

The second species—

Didelphys microtarsus,

Also resembles *D. murina*, but has the ears much larger, the tail of a deep reddish grey, and with minute hairs on the under side, and the tarsi short and slender.

I will here introduce some other species of Opossums described by the same author in the work mentioned. The species in question were collected by Dr. Natterer during his long sojourn in Brazil; some of them are stated to be destitute of a pouch, and therefore belong to the present section, and it is highly probable that the females of the remainder are also pouchless. The shortness of the tail in the following four species would seem to indicate that they are very nearly allied to the *Didelphys tricolor*, and the *D. brachyura*.

Didelphys domestica. (Natt.) Wagner.

Wiegmann's Archiv für Naturgeschichte, viii. (1842), p. 359.

General tint yellowish grey, beneath pale yellowish; ears moderately large; head without any stripe; tail short and thickish, with minute white scattered hairs. The female has no abdominal pouch. Length of the body 7 inches; of tail, 2 inches 4 lines.

From Cuyaba.

Didelphys glirina. (NATT.) WAGNER.

WIEGM., Archiv, *l. c.*

Fur ashy grey; under parts of the body hoary grey, washed with yellowish; the sides ochreous; head short; ears moderate; tail not quite equal to half the body in length, hairy at the base; beyond, almost naked. Length of the body 6½ inches; of tail, 2 inches 7 lines.

From Mamoré.

Didelphys velutina. (NATT.) WAGNER.

WIEGM., Archiv, *l. c.* p. 360.

General tint mouse-grey, under parts whitish, the white separated from the grey by a well marked line; tail, excepting at the base, beset throughout with minute, adpressed, glossy hairs, and these of a brown colour. Length of body 3¾ inches; of tail, 2¾ inches.

From Ypanema.

Didelphys unistriata. (NATT.) WAGNER.

WIEG., Archiv, *l. c.*

This species has the upper parts reddish mixed with grey, and on the back is a darker stripe; the under parts are reddish; the tail short, and slightly hairy. Length of the body 5¼ inches; of tail, 2¼ inches.

From Ytarare.

All the above new species of Didelphys, described by Dr. Wagner, are contained in the Museum at Vienna, and were collected in Brazil by the late Dr. Natterer.

DIDELPHYS PUSILLA.

Diminutive Opossum.

Didelphis pusilla. DESMAREST, Nouv. Dict. d'Hist. Nat. tom. ix. p. 430. 1817. Mammalogie, Pt. 1, p. 261, sp. 399. 1820.
Micouré sixième, ou *Micouré nain.* AZARA, Essai sur l'Hist. Nat. des Quadrupèdes du Paraguay, tom i. p. 304.

Fur short, and soft; on the upper parts of the animal, mouse-grey, and on the under, whitish; eye surrounded with black, the black most extended in front; the region above the eye, whitish, and a yellowish white spot is situated beneath the eye: tail naked.

Inhabits Paraguay.

A small Opossum in the British Museum Collection bearing the name *D. pusilla*, agrees closely with Azara's description and dimensions. The specimen is preserved in spirits, and in its size and proportions, and (so far as one may judge from a specimen in the condition mentioned), in the character of the fur and its colouring, greatly resembles the Common Mouse. The under side of the tail at the extremity is perfectly naked, and the callous skin of this part shows that it is used for prehension: the naked part extends backwards from the point of the tail about half an inch; the remaining portion is covered with small scales, from between which small hairs spring, as in the common mouse. A narrow black ring surrounds the eye, and the sides of the muzzle, near the anterior angle of the eye, are dusky; the upper lip

and the cheeks are yellowish white. There are two distinct grooves on either side of the mesial notch formed by the termination of the nasal groove, in the upper lip. The ears are clothed throughout with small hairs. I add the dimensions of this animal (which I think is without doubt the true *D. pusilla* of Desmarest) to those given by Azara.

	From Azara. Male. Inches.	From Azara. Male. Lines.	From B. M. specimen. Male. Inches.	From B. M. specimen. Male. Lines.
Length from tip of nose to root of tail	3	6	3	3
" of tail	3	10	3	9½
" from nose to eye				4⅓
" from ditto to ear				10
" of ear		6		5½
Width of ditto		4⅓		5½
Length of fore foot				4½
" of hind foot				6

DIDELPHYS ELEGANS.

Elegant Opossum.

(*Plate* 16, fig. 1).

Didelphys elegans. WATERHOUSE, Zoology of the Voyage of H.M.S. Beagle, Mammalia, p. 95, Pl. 31. — *Naturalists' Library,* (Marsupialia), Vol. xi. p. 106.

" *hortensis.* REID, Proceedings of the Zoological Society for January, 1837, Pt. 5, p. 4.

Thylamys elegans. GRAY, List of the Mammalia in the British Museum, p. 101. 1843.

Fur long, and very soft, of a delicate yellowish ash colour on the upper parts, slightly suffused with black, or brown, on the back, and white on the under parts; ears rather large; eyes

surrounded with black; tail about equal to the head and body in length, and usually very thick; feet small.

Inhabits Chili.

The fur of this little animal is long, and remarkably soft, and composed of hairs of one kind only: presenting none of that woolly or cotton-like texture so generally found in the small Opossums; the hairs on the back are of a darkish slate-grey next the skin, and annulated near the point with ash colour, and sometimes with yellowish, and tipped with rusty black; on the sides of the body they are also of a deep slate-grey at the root, but at the point they are of a delicate yellow tint, or sometimes of a deep cream colour; on the under parts of the body the hairs are of a pure white colour throughout their whole length. The general tint of the upper parts varies somewhat, being sometimes ashy grey, slightly suffused with black along the middle of the back, and sometimes yellowish ash colour, suffused with brown. The white of the under parts is separated by a tolerably well defined line from the darker hue of the upper, and extends about half way up the sides of the body; the flanks, immediately above the white parts, are always more or less tinted with yellow. The head is rather short; the ears tolerably large, and of a greyish brown hue, but pale at the root; they are clothed throughout with very minute hairs: a broadish black ring encircles the eye, and the sides of the muzzle are suffused with blackish. There is but one indentation on the lower margin of the muffle, on either side of the mesial groove. The legs and feet are white; the latter are smaller than usual. The tail is remarkably thick in most of the specimens which have come under my notice, but I have seen some in which it was scarcely thicker in proportions than in most other Opossums; when incrassated the thickest part is

near the termination of the first quarter of the entire length; from that point it rather suddenly diminishes in diameter, and at the extremity it terminates in a fine point; at the base it is distinctly constricted; about a quarter of an inch of the tail, at the apex, is bare beneath, and there is a longitudinal groove on this part; the remaining portions are covered with minute adpressed hairs, which, however, are not sufficiently numerous to hide the skin: the scales on the skin are very indistinct.

	Female?		Male.				Male, preserved in spirits, Brit. Mus.		Female?[1]	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	4	1	5	5	4	6	4	1	5	3
" of tail	3	6	4	2	4	4	4	3	5	2
Diameter of ditto near the root		5						4¾		
Length from nose to eye		6½		7				5½		
" " nose to ear		9¼	1	0½	1	1½		11½	1	0½
" of ear		7¾		7½		7¼		7¾		7¾
Width of ditto ...		7½				7½		7		
Length of fore foot ...		5½						6		5½
" of hind foot ...		7½		7		7½		7¼		7⅓
" of skull ...	1	1	1	2¼	1	2½				
Width of ditto		7⅙		8⅓		8				
" " between orbits		2¼				2½				
Length of nasal bones[2]		5⅓								
" of palate ...		7				7¼				
" from front of foremost incisor to back of last molar tooth		7¼								
" of lower jaw ...		10				10½				

[1] In this specimen, which is apparently a female, the tail is not incrassated, but I am satisfied that the thick tail is not peculiar to either sex.

[2] The nasal bones are not expanded behind, as is usual in the Opossums, but are of very nearly the same width throughout.

The *Didelphys elegans* is found nearly throughout Chili; Mr. Bridges informs me that he has found it as far north as Cobija, and that in the opposite direction it extends to Curico, in the province of Colchagua. Mr. Darwin, who first brought specimens to Europe, states that these little animals are frequent in the thickets growing on the rocky hills, near Valparaiso. They are exceedingly numerous, and are easily caught in traps baited either with cheese or meat. The tail appeared to be scarcely at all used as a prehensile organ: they are able to run up trees with some degree of facility. Larvæ of beetles were found in the stomachs of specimens dissected.

DIDELPHYS TRISTRIATA.

Three-striped Opossum.

Didelphys tristriata.	KUHL, Beiträge, p. 63. 1820.
" "	FISCHER, Synopsis Mammalium, p. 269. 1829.
" "	WATERHOUSE, Nat. Libr. (Marsupialia), Vol. xi. p. 107, Pl. 3.
Sorex Brazilensis.	ERXLEBEN, Systema Regni Animalis, p. 127. 1777.
" "	SCHREB., Säug. p. 577. 1778.
" "	GMEL. LINN., Syst. i. p. 115. 1788.
La Musaraigne du Brézil.	BUFF., Hist. Nat. tom. xv. p. 160. 1767.
Brazilian Shrew.	PENNANT, Synopsis of Quadrupeds, p. 309. 1771.

Fur very short, of a rich brown hue on the upper parts of the body, and suffused with rust colour on the hinder parts; abdomen rusty yellow: three longitudinal black stripes on the back. Ears small; tail short.

Inhabits Brazil.

The small size, and comparatively short ears and tail,

combined with a sharply-pointed muzzle, give to the present species the aspect of a Shrew-mouse, and hence by the older authors we find it arranged amongst the Shrews; no animal belonging to the order *Insectivora*, however, has yet been found in South America: the true Insectivora are there replaced by the Opossums. The species already described all climb trees more or less, and possibly the Three-striped Opossum may also climb, but I suspect that this animal lives chiefly upon the ground, and that it seeks shelter in burrows, as is the case with the short-tailed species, which remain to be noticed. Our little animal is found in but few museums, having probably escaped collectors from its small size, it being not larger than the common mouse. The following description is drawn up from a specimen contained in the museum of the Zoological Society. It was purchased from a dealer in Liverpool, who did not know from what part of America it was procured.

The fur of the Three-striped Opossum is short, moderately soft, somewhat closely applied to the body, and of a grey colour next the skin, both on the upper and under parts of the animal. The general tint of the upper parts is rich brown, the fur being pencilled with deep yellow and black on the back; on the sides of the body the black gradually disappears towards the lower parts, where a rich rusty yellow tint prevails, and the same yellow hue is observed on the whole of the under parts of the animal. The three black marks on the back are rather broad; the central one commences near the tip of the muzzle, and extends backwards along the head and back, and on to the basal portion of the tail: on the middle of the back this stripe is fully a quarter of an inch in width; the other two dark stripes are less broad, they commence immediately behind the ears, and extend to the root of the tail. The ears are small, rounded, and nearly naked, but some very minute brown hairs are scattered over

both the outer and inner surfaces. The tail, in like manner, has minute scattered hairs, and these are of a blackish brown hue on the upper surface of the organ in question, and brown on the under: fur, like that on the body, extends on the basal portion of the tail, covering a space of about one-third of an inch in length.

		Inches.	Lines.
Length from tip of nose to root of tail	...	4	3
" of tail	...	2	1
" from tip of nose to ear ...	...	1	0½
" of ear	...		3
" of hind foot and claws ...	...		8¾

DIDELPHYS TRICOLOR.

Tricoloured Opossum.

Didelphis tricolor.	(GEOFF.) DESM., Nouv. Dict. d'Hist. Nat., ix. p. 429.
" "	TEMM. Monogr. i. p. 52.
" *brachyura.*	PALLAS, Act. Petrop. Ann. 1780, ii. p. 235, Tab. 5.
Le Touan.	BUFF., Hist. Nat. Suppl. vii. p. 252, Tab. 61.

Head large; tail about equal in length to half that of the trunk of the animal: fur short; on the upper parts of the head and body, black, obscurely pencilled with white; on the sides of the body deep rusty red, and on the under parts, white.

Inhabits Guiana.

The Tricoloured Opossum is readily distinguished by its short tail, combined with the three distinct colours of black (or nearly black), rusty red, and white, with which its body is adorned. Its fur is dense, and very short, and of a grey hue next the skin, both on the upper and under parts of the body; on the back the visible portions of the hairs are black,

but they have most of them a white ring near the point, sometimes very narrow and indistinct, and sometimes broader, in which case the general tint produced by the mixture of black and white is grey-black, or dark grey. The chin, throat, the sides of the face (extending above the eye), and the sides of the body, as well as the outer surface of the legs, are of a deep rusty red hue; the chest, and the whole of the abdomen, are pure white, or sometimes white faintly tinted with yellow. The ears are rather smaller than usual, and of a dark hue. The tail is short, and thick at the root; the basal half, or rather more, is clothed with fur like that on the body, excepting on the under surface, which is naked, or very nearly so; here, as well as on the remaining portion, the terminal half above, is clothed with short black hairs. The feet are black, slightly freckled with rust colour.

	Inches.	Lines.
Length from tip of nose to root of tail ...	5	6
" of tail	2	8
" from nose to ear	1	2½
" of ear		5
" of hind foot		10

According to M. Temminck, adult specimens of the present species vary from nine, to nine and a quarter inches, or rather more, in entire length, of which the tail is about three and a quarter inches.

My description is taken from specimens in the Paris Museum, one of which is from Cayenne, where it is said to be most abundant. M. Desmarest states that, whilst in Paris, Azara recognized, in a specimen of the *D. tricolor* contained in the National Museum, his *Micouré à queue courte*; hence we find in systematic works, published since that time, the Three-coloured Opossum is given as a native of Paraguay as well as Guiana. Azara's description, however,

agrees perfectly with the *Didelphys brachyura* of authors, a nearly allied species, and which we know extends as far south as the River Plata; and hence I am induced to believe that Azara, who was possibly not acquainted with this second short-tailed species, and who, it must be borne in mind, was trusting to his memory, was mistaken in the identification.

DIDELPHYS BRACHYURA.

Short-tailed Opossum.

(*Plate* 16, fig. 2).

Didelphis brachyuros.	SCHREB., Säug. iii. p. 548, Pl. 151. 1778.
" *brachyura.*	GMEL. LINN., Syst. i. p. 108.
" "	TEMM., Monogr. i. p. 53.
" "	WATERH., Zoology of H.M.S. Beagle (Mammalia), p. 97, Plate 22.
Short-tailed Opossum.	PENNANT, Quadr. p. 208.

Tail short; fur short, grey on the upper parts of the head and body, and rusty yellow on the sides and under parts, rather paler on the abdomen than elsewhere: feet yellowish.

Inhabits Guiana and Brazil, and extends southwards as far as the River Plata.

The head of this animal is larger than usual, in proportion to the body; the canine teeth are large; the tail is not quite equal to half the body in length. The fur is short and dense, and moderate as to texture, of an ashy grey hue on the upper surface of the head, and on the back, and of a rusty yellow on the sides of the head and body, as well as on the under parts; but here the hue is rather paler than elsewhere. The tail is tolerably well clothed with short stiff hairs, which,

excepting on the basal portion, are not sufficiently numerous to hide the scaly skin beneath: at the tip of the tail beneath is a small naked space of about a quarter of an inch in length. The ears, which are very short as compared with those of most other Opossums, are clothed with small yellowish hairs.

It is necessary to observe that this animal is subject to some slight variation in its colouring. Sometimes the upper parts of the body are suffused with yellowish. A specimen in the British Museum collection has the sides and under parts of the body unusually pale, the former being tinted with ochreous yellow, and the latter yellow-white: its back is ashy grey, pencilled with black; about half an inch of the tail at the base is covered with fur like that on the body, and the remaining portions are well clothed with short black hairs; the sides of the muzzle are brown; and the feet are of a pale dirty yellow tint. It is from Brazil.

	Zoological Society.		MALE, Brit. Mus.		Paris Museum.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	6	0	6	6	6	9
" of tail	2	8	2	7	2	6
" from nose to ear	1	6	1	4½	1	3
" of ear		3¼		4		3¼
" of fore foot and nails				8		
" of hind foot		8¾		9½		8½

The first of the above columns contains the dimensions of a specimen brought by Mr. Darwin from Maldonado, La Plata.

Didelphys Hunteri.

Didelphys Hunteri. WATERH., Naturalist's Library (Marsupialia), Vol. xi. p. 110.

The above name was proposed for a small species of Opossum, agreeing in size and proportions very nearly with the *D. tricolor* and the *D. brachyura*, but which differs from those animals in its colouring, the upper parts of its body being of an uniform brown-black tint, and the under parts pale brown: it presents no trace of the rusty hue on the flanks, which characterizes the *D. tricolor*. The specimen is preserved in spirits in the Museum of the College of Surgeons, and formerly formed part of the collection of the celebrated John Hunter, after whom the animal is named. Of course this cannot be regarded as a well-established species.

Didelphys pœcilotus.

This species, described by Dr. Wagner in the volume of Wiegmann's Archive, already quoted (at p. 358 of Vol. viii.), should have been introduced next to the *Didelphys cancrivora*, agreeing with that animal in its general characters, and no doubt possessing a pouch. It is said to be nearly equal in size to the *D. cancrivora.* Its woolly fur is whitish, and the long interspersed silky hairs are white at the base, and black at the point, or some few of them are white throughout: the head is white, and has three narrow black stripes; the ears are of a whitish flesh colour, spotted with black. Inhabits Brazil—Agaba.

Since the preceding pages were printed, copies of the published parts of Dr. Tschudi's *Fauna Peruana* have

arrived in England, and the author, having been favoured by Mr. Gould with the loan of this work, is enabled to notice certain Peruvian species of Opossum described by Dr. Tschudi, which that naturalist regards as new to science. These are respectively named *Didelphys ornata*, *D. noctivaga*, and *D. imparida*.

Didelphys ornata.

Didelphys ornata. Tschudi, Fauna Peruana, Pt. 2, Pl. 7, and Pt. 4, p. 146. 1845.

Fur dense, and somewhat woolly; on the upper parts of the body of a rusty brown colour, suffused with black; on the under parts grey-white; chest pure white: head with a blackish mesial line, on each side of which are two longitudinal grey lines; muzzle dusky; ear encircled with brown, the brown extended forwards on to the sides of the muzzle, and backwards to the ear: between the shoulders is an oblong, but nearly heart-shaped, white patch. About half the tail is clothed above with fur like that on the body; the naked portions are yellowish: ears large and naked, and of a brown-red colour.

	Inches.	Lines.
Length from nose to root of tail	11	0
" of tail	12	0
" of hairy portion of ditto, above ...	6	6
" of ditto, below	3	6
" of head	2	6
" of ears	1	0
Width of ditto		9
Length of fore foot	1	0
" of hind ditto	1	3

The description, it will be seen, accords in all essential points with my account of *D. Derbiana*. The pale mark on the back, it would appear, is more expanded in Dr. Tschudi's

animal than in that described by myself, but I see no reason to doubt the specific identity of *D. ornata* and *D. Derbiana*.

Didelphys impavida.

Didelphys impavida. TSCHUDI, Fauna Peruana, Pt. 4, p. 149; Pt. 2, Pl. 9.

Fur moderate as to length; on the upper parts of the body reddish brown, suffused with black; on the sides of the body of a fulvous yellow, and on the under parts white; eyes encircled with black, the black prolonged in front almost to the extremity of the muzzle; a longitudinal pale stripe on the forehead: tail grey-brown, and with small silvery white hairs springing from between the scales. Female with abdominal folds of skin.

	Inches.	Lines.
Length from tip of nose to root of tail ...	6	3
" of tail	5	4
" from nose to ear	1	6
" of ear		9

Like others of its group, this species is nocturnal, and during the day remains hidden in holes in the earth, or under the roots of trees. The strong light of the sun, Dr. Tschudi states, so dazzles this animal, that it is easily captured. Of the seven species of Didelphys noticed in Peru by the author just mentioned, six were met with in the thickest forests, and one in the open fields: several live exclusively on vegetable substances, and prefer the fruits of the bananas to all others. The *D. noctivaga* was frequently caught in the huts on the bananas hung up to ripen. By using a dark lantern a strong light was suddenly thrown upon them when committing their nightly attacks upon the fruits in question, and this so stupified them that they were readily captured by the hand. The *D. impavida* also frequently visited the huts of the

travellers in the night, and, indeed, was exceedingly troublesome, running, as the Doctor observes, over their faces and hands, and always returning after being driven away.

Didelphys noctivaga.

Didelphys noctivaga. Tschudi, Fauna Peruana, Pt. 1, p. 148, and Pt. 2, Pl. 8.

Fur soft and long; upper parts of the body greyish brown, suffused with dusky; sides of the body reddish yellow; under parts yellowish white; along the mesial line of the belly the hairs uniform in colour to the root; on other parts of the body the fur grey next the skin: a pale, yellowish, longitudinal stripe on the upper surface of the head; the eyes encircled with black-brown, and this dark colour well defined; lower region of the ear reddish yellow, and the throat and breast suffused with the same colour: a very small portion of the tail clothed with fur; the naked portion red-brown: ears naked, and reddish: feet light brown; the toes whitish yellow; the soles flesh coloured. Female provided with abdominal folds of the integument.

	Inches.	Lines.
Length from tip of nose to root of tail ...	6	9
" of tail	7	4
" from nose to ear	1	3
" of ear		9½

With respect to the geographical ranges of the preceding three species, and some other Opossums found in Peru, Dr. Tschudi furnishes us with the following particulars :—

Didelphys Azaræ, Dr. Tschudi observes, has a very extensive range, being met with throughout the whole of South America, to 45° south latitude: in Peru it occurs in all the districts, and particularly in the western district. A female,

with young, was killed at a spot having an elevation of more than 12,500 feet above the sea: in the hot, woody parts, it disappears, and it is very rare on the east slope of the coast Cordilleras at an elevation of 6,000 feet above the sea. *Didelphys myosuros* (or *D. nudicaudata*) and *D. Opossum*, live in the districts of the coast, and the forest; the former also occurs in the Sierra region at an elevation of from 9,000 to 10,000 feet above the sea; the latter has not been found above the Ceja region. The three species *D. noctivaga*, *D. impavida*, and *D. ornata*, have hitherto been exclusively found in the middle and deep forest regions, and the climate at an elevation above 8,500 seems to be unfitted for them. Their horizontal range is also small, since they have only been met with between the 10th and 12th degrees of south latitude. *D. murina*, on the other hand, has a wide horizontal range, being found throughout the whole of the northern parts of South America, from the Atlantic to the foot of the inner Cordilleras.

Didelphys Cuvieri (Fossil).

Didelphys Cuvieri. FISCHER, Synopsis Mammalium, p. 268.

Dr. Fischer gives the above name to the animal whose skeleton was discovered by Cuvier in the Eocene Tertiary formation of the Paris basin. The skeleton in question agrees most nearly in size with that of the *Didelphys murina*, but the separate bones differ in their proportions. It exhibits distinct marsupial bones; the angle of the lower jaw was found to be bent inwards, as in the Marsupialia, and the true molar teeth remaining in the fractured skull, agree with those of the Opossums, both in number and form. In fact, very satisfactory evidence is deduced by Cuvier from this skeleton, to

the effect that a small insectivorous Marsupial Mammal coexisted with the Anoplotheria, Palæotheria, and other now extinct Mammals of the Paris Gypsum Quarries, but that that animal was a member of the genus *Didelphys*, as now restricted, could not be satisfactorily ascertained, inasmuch as the specimen did not exhibit the incisor and premolar teeth. A copy of Cuvier's figure of this skeleton will be found at p. 13; figs. A and B.

Fossil Didelphidæ of the Brazilian Caverns.

I have before me fragments, from the above caverns, which are clearly referrible to seven or eight distinct species of *Didelphys*. The specimens are chiefly rami of lower jaws, which differ in size and proportions, and correspond very closely, as regards size, with the different species now inhabiting Brazil. Indeed, there are no fragments appertaining to the marsupiate division of Mammalia, in the extensive collection of remains, procured from the Brazilian caverns, now in the British Museum, which are not referrible to the true Opossums, nor do I find any, the size and proportions of which would lead me to suspect they belong to species which are not known to exist at the present day in Brazil.

Sub-genus, *Chironectes.*

Chironectes. ILLIGER, Prodromus Systematis Mammalium, &c. p. 76. 1811.

Opossums having large hind feet, the toes of which are united by a web; the fore feet moderate, and with an unusual elongation of the pisiform bone. Females provided with a perfect pouch. Habits aquatic.

The present section contains but one known species, the *Chironectes variegatus*, or *Chir. Yapock*, of modern authors, an animal rarely found in museums, and of which we have only had an opportunity of examining an imperfect specimen. A skin, having the skull *in sitû*, was placed in Mr. Ogilby's hands for examination by Dr. Natterer, and in a communication published in the Proceedings of the Zoological Society will be found a detailed account of such characters as could be gleaned from this specimen. Amongst other peculiarities of the Chironectes, pointed out by Mr. Ogilby[1], that gentleman notices the existence of large cheek-pouches, extending far back into the mouth, and of which the opening was very apparent[2]. Mr. Ogilby's remarks upon the dentition of the Chironectes, as the only detailed account of these organs hitherto published, I will give in that gentleman's own words. "The teeth of this animal," Mr. Ogilby states, "are altogether different from those of the Opossums (Didelphys), and I am at a loss to reconcile my own observations with those of M. F. Cuvier upon this subject, as given in the Dents des Mammifères, p. 73, unless by supposing there must have been some mistake about the skull referred by M. Cuvier to the *Yapock*. For my own part, I could not be deceived in this matter, as the skull which I examined had never been extracted from the specimen. The incisors and canines are of the same form and number as in the true Opossums; the two middle incisors above, being rather longer than the lateral, those below broader, and a little separate. The molars are five on each side, two false, and three real, both in the upper and under jaws. The first false molar is rather small, and in contact with the canine both above and below: the second is half

[1] See Proceedings of the Zool. Soc. for May, 1836, p. 57, Part 4.

[2] Dr. Wagner remarks, that unless Mr. Ogilby's observations upon this point were made upon a specimen preserved in spirits, they require confirmation.

as large again, and both are of a triangular form, with apparently two roots. The three real molars are of the normal form of these teeth among the Opossums. The first of the upper jaw is longer than broad, and has four sharp, elevated tubercles, with a low heel projecting backwards; the second resembles it in general form, but is larger and broader; the third is small, and resembles the tuberculous molars of the true *Carnivora*. In the lower jaw the three real molars do not materially differ in point of size: they are narrower than those of the upper, have their tubercles arranged in a single longitudinal series, a single large one in the centre, and a smaller one on each side." This last phrase points out a difference in the structure of the molars of the Chironectes and true Opossums, since the latter animals present two longitudinal series of tubercles; beyond this it does not appear that there is any difference in the structure of the teeth of the animal under consideration, and the species of *Didelphys*, unless it be in the last upper true molar, which is compared to the tuberculous molars of the true *Carnivora*—teeth which differ very much in different species of that group. With regard to the number of the teeth, which we find in the animal examined by Mr. Ogilby was less than in the Opossums, it is necessary to observe, that such a difference might arise from a difference of age; and on this point I have to remark, that the *Yapock*, upon which the foregoing notes were drawn up, was inferior in size to others brought to Europe by Dr. Natterer, and that that gentleman informed me it was a young animal. Now, we know that in Opossums which have nearly attained their full size, but which are still immature, the hindermost molar tooth, on either side of the jaws, is but partially developed, and, were the skin not removed from the skull (as I suspect was the case in the Yapock described by Mr. Ogilby), would not be

visible; and beyond this, we find that at the time that the last true molar of the Opossum is in this undeveloped condition, the hindermost of the milk teeth is shed to make way for a permanent false molar which takes its place; there would then, however, be a vacant space between the second false molar and the first true molar, and such a vacancy is not noticed by Mr. Ogilby[1].

CHIRONECTES VARIEGATUS.

Water-Opossum.

(*Plate* 17, fig. 1).

Lutra minima.	ZIMMERMAN, Geogr. Geschicht. ii. p. 317. 1780.
" "	BODDAERT, Elenchus Animalium, i. p. 165. 1785.
" *Sarcovienna.*	SHAW, General Zool. vol. i. Pt. 2, p. 447. 1800.
Chironectes variegatus.	ILLIGER, in Abh. der Berl. Acad. 1811, p. 107.
" *Yapock.*	DESMAREST, Mammalogie, p. 261, 1820. Dict. des Sci. Nat. tom. xlvii. p. 400. 1827.
Didelphys palmata.	(GEOFF.) FISCHER, Synopsis Mammalium, p. 266. 1829.
Petite Loutre de la Guyane.	BUFFON, Hist. Nat. Suppl., tom. iii. p. 159, Tab. 22. 1776.
Saricovienne.	PENNANT, Quad., vol. ii. p. 355. 1781.
Yapock.	CUV., Règne Animal (ed. 1817), tom. i. p. 174.

Ears large and naked; tail longer than the head and body taken together; fur short, dense, and somewhat woolly; upper

[1] I have thought it desirable to make these remarks, because I find Dr. Schinz, in his recently published work upon Mammalia, has adopted as the true dental formula of the Chironectes, that which has been found in one specimen only—the specimen examined by Mr. Ogilby, and for the reasons stated I am by no means satisfied that this animal, when adult, does not present (as M. F. Cuvier has stated it actually does) the same dentition as the true Opossums.

surface of the head, and the back, sooty black ; sides of body grey, the grey running upwards in three places, so as nearly to divide the black of the back into separate patches ; a grey mark behind the ear, and a transverse, but somewhat curved band, of the same colour, on the crown of the head ; under parts of head and body white : tail naked and scaly (excepting at the root, which is clothed with fur like that on the body), black, but terminated with white.

Inhabits Guiana and Brazil.

The following description is taken from a specimen of the Yapock, or Water-Opossum, contained in the collection of the Zoological Society. The specimen is rather larger than the common Brown Rat (*Mus decumanus*), and somewhat resembles that animal in its proportions. The fur is soft, dense, and somewhat woolly; white on the under parts of the head and body, and on the upper parts grey, but with large, sooty-black patches : black is the prevailing hue on the back, and grey on the sides of the body. The muzzle, and, indeed, the whole upper surface of the head, is black, if we except a curved grey band (having its convex side forwards) which crosses the forehead ; the black runs backwards from behind the eye on to the sides of the neck ; the upper lip is white. The hairs of the moustaches are for the most part black, but some of them are white. On the back are four large black patches, joined by a broad black dorsal line. The foremost of the patches crosses the shoulders, and extends a short distance on the outer surface of the fore leg, leaving, however, the anterior and lower parts grey. The second patch is placed near the middle of the back, and is almost circular; the third is situated near the hinder part of the back, and the fourth crosses the rump, runs down the back of hind legs, and extends also on to the hairy portion of the

tail above. About two and a half inches of the tail is clothed with fur like that on the body; the remaining portion is covered with scales, between which spring short bristly hairs; the scaly part of the tail is chiefly black, but the apical portion is white, the white extending backwards about four inches from the point. The upper suface of the feet is brownish: the toes of the fore feet are long, united at the base to the end of the first phalanx: on the outer side of the foot is an elongated tubercle, having the appearance of a rudimentary sixth toe; the fleshy pads on the under surface of the foot are very large and rough; the nails are small, and partially embedded in the large fleshy pads with which the toes are terminated. The hind feet are very large; the toes are long, and tied together by an ample web, which extends to the base of the claws. The opposable, thumb-like, inner toe, as usual, has no nail; the claws of the other toes are of moderate size, curved, and compressed; those of the two inner toes are more compressed than the others.

	Inches.	Lines.
Length from tip of nose to root of tail ...	10	6
" of tail	13	6

In the specimen examined by Mr. Ogilby, which has already been referred to, the head and body measured ten inches, and the tail was of the same length. Dr. Natterer, however, informed Mr. Ogilby that he had specimens which measured fourteen or fifteen inches. The specimen described by Buffon was a young animal, and was supposed by him to be a species of Otter, and indeed for a long period the Yapock was classed by mammalogists amongst the Otters.

In its habits the Water Opossum greatly resembles the animals just mentioned. Buffon's specimen was found in Cayenne, and, according to Dr. Natterer, it is likewise a

native of Brazil, occurring in all the smaller streams of that district. Two of Dr. Natterer's specimens, that gentleman informed me, were caught near water not far from Rio Janeiro, and a third was captured in the water, alive, near Para, in a basket similar to those used for catching eels in this country: it had made its way through the funnel-shaped opening, and could not return; thus proving that the animals are good divers. They feed upon crustaceous, and no doubt upon other aquatic animals.

Distribution of the Species of Didelphys.

United States.	*California.*	*Mexico.*	*Peru.*	*Guiana.*	*Brazil.*	*Paraguay.*	*Banda oriental.*	*Chili.*
Virginiana								
			Azaræ		Azaræ	Azaræ	Azaræ	
	Californica	pruinosa			pœcilotus			
	breviceps	Californica			albiventris			
				cancrivora	cancrivora			
				Quica	Quica			
			nudicaudata	nudicaudata	nudicaudata			
			Opossum	Philander	Opossum			
			Derbiana		dichura			
					ochropus	lanigera		
					cinerea	crassicaudata	crassicaudata	
					macrotarsus	grisea		elegans
			noctivaga		microtarsus			
			impavida		domestica			
					glirina			
		murina	murina	murina	murina			
					pusilla	pusilla		
					velutina			
					unistriata			
					tricolor			
				brachyura	brachyura	brachyura	brachyura	
					tristriata			
				variegata	variegata			

The preceding table shows that the great metropolis of the Opossums is Brazil, and that in proportion as the various districts mentioned are more widely separated from that province, so do the species decrease in number. The natural barrier of the Cordilleras, it seems, has prevented the passage of a single species from the eastern, to the western side of those mountains. The Great River Plata forms the southern boundary of the province of the Opossums[1].

With respect to the distribution of the Marsupiata inhabiting Australia and the neighbouring islands, some remarks will be found in the introductory observations upon the group; and at page 3 is a table showing the distribution of the species of *Cuscus* which inhabit the islands north of Australia; in that table the name *chrysorrhos* should be inserted in the column for New Guinea, a specimen of that species of Cuscus having been shot by Mr. Jukes in that island[2]. The species of Marsupiata now known to be natives of New Guinea are as follows:—*Cuscus maculatus*, *Cuscus chrysorrhos*, *Dendrolagus ursinus*, *Dendrolagus inustus*, *Macropus Brunii*, *Petaurus* (*sciureus*?), *Phascogale melas*, and *Perameles Doreyanus*.

Australia may be conveniently divided into five principal divisions or districts, of which the East, West, North, and South portions of the main land will each form one province, and Van Diemen's Land the fifth. Of these provinces, the northern one has the greatest number of species peculiar to it, since out of ten species discovered in that part of Australia,

[1] With regard to the numerous so-called species forming the first section of the genus Didelphys, I have to observe, that they have been founded for the most part upon very trivial characters, and I think it highly probable that when sufficient materials are collected for a rigorous examination of the group, it will be found to be composed of but one or two variable species, instead of seven or eight, as now supposed.

[2] The specimen has recently been presented by Mr. Jukes to the British Museum.

eight are not found elsewhere. The Marsupiata of the Eastern district are for the most part distinct from those of the opposite side of the continent, there being but eight species, out of upwards of sixty inhabiting the two provinces, which are found in both. But if the three districts mentioned are characterized by the few species which they have in common, South Australia must be characterized by an opposite quality, that of having a comparatively large proportion of species identical with those of other districts; indeed, I know of but four species which are peculiar to this district: it possesses sixteen species in common with Western Australia, and fifteen in common with Eastern Australia. Western Australia possesses one genus (*Tarsipes*) which is peculiar to it, and one sub-genus (*Macrotis*); none of the other districts of continental Australia possess any genera which are not found elsewhere. About half of the species found in Van Diemen's Land are peculiar to that island—in fact, nine out of twenty: of the remainder, the greater portion are found on the eastern part of the main land. This island, moreover, possesses one genus (*Thylacinus*), and one sub-genus (*Sarcophilus*), which are now peculiar to it. Examples of both these sections have, however, been found in a fossil state on the main land.

Subjoined is a list of the species inhabiting each of the districts mentioned.

DISTRIBUTION OF THE MARSUPIATA IN AUSTRALIA.

South Australia.

Macropus giganteus.
,, lunatus.
,, leporoïdes.
,, fasciatus.
,, rufus.
,, Greyi.
,, Eugenii (Nuyt's Archipelago).
,, Derbianus (from islands off the coast).
Hypsiprymnus Grayi.
,, penicillatus.
,, Gaimardi.
,, *campestris.*
Phascolomys Wombat.
,, latifrons.
Phascolarctos cinereus.
Phalangista vulpina.
,, Cookii.
,, concinna.
Petaurus Australis.
Perameles obesula.
,, fasciata.
Chœropus castanotis.
Myrmecobius fasciatus.
Phascogale penicillata.
,, flavipes.
,, albipes.
,, crassicaudata.
Dasyurus Geoffroyi.

North Australia.

Macropus unguifer.
Macropus antilopinus.
,, agilis.
,, brachiotis.
,, inornatus.
,, concinnus.
Phalangista vulpina.
Petaurus breviceps var. Ariel
Perameles macroura.
Dasyurus hallucatus.

Western Australia.

Echidna aculeata.
Macropus giganteus.
,, (giganteus) ocydromus.
,, lunatus
,, isabellinus.
,, fasciatus.
,, hirsutus.
,, conspicillatus, Barrow Island.
,, Irma.
,, Derbianus.
,, brachyurus, K. George's Sound.
,, lateralis.
Hypsiprymnus Grayi.
,, penicillatus.
,, Gilbertii (King George's Sound).
,, platyops.
Phalangista vulpina.
,, ,, var. xanthopus.
,, Cookii.
,, concinna.
,, Neillii (King George's Sound).
Tarsipes rostratus (Swan River and King George's Sound).

Perameles (Macrotis) lagotis (ditto, ditto).
,, Bougainvillii (Peron's Peninsula—Shark's Bay).
,, obesula.
,, myorsuros (Swan River and King George's Sound).
Chœropus castanotis (Swan River).
Myrmecobius fasciatus (Swan River and King George's Sound).
Phascogale penicillata.
,, calura.
,, apicalis.
,, leucogaster, var. flavipes ?
,, albipes (?)
Phascogale crassicaudata.
Dasyurus Geoffroyi.

Van Diemen's Land.

Ornithorhynchus paradoxus.
Echidna (aculeata) setosa.
Macropus giganteus.
,, ruficollis, var. Bennettii.
,, Billardierii.
Hypsiprymnus cuniculus.
,, murinus.
Phascolomys Wombat.
Phalangista vulpina.
,, Cookii.
,, nana.
Perameles obesula.
,, Gunnii.
Phascogale Swainsonii.
,, minima.
,, leucopus.
Dasyurus maculatus.
,, viverrinus.
,, ursinus.
Thylacinus cynocephalus.

Bass' Strait.

Echidna.
Macropus ruficollis (King Island).
Phascolomys Wombat (ditto)
Dasyurus maculatus (ditto).

New South Wales.

Ornithorhynchus paradoxus.
Echidna aculeata.
Macropus giganteus.
,, frænatus (interior).
,, leporoïdes.
,, robustus (interior).
,, rufus.
,, Parryi.
,, Ualabatus.
,, Thetidis.
,, Parma.
,, dorsalis (interior).
,, penicillatus.
Hypsiprymnus rufescens.
,, penicillatus.
,, Gaimardi.
,, murinus.
Phascolomys Wombat.
Phascolarctus cinereus.
Phalangista vulpina.
,, canina (interior).
,, Cookii.
Petaurus taguanoïdes.
,, Australis.
,, sciureus.
,, breviceps.
,, (acrobata) pygmæus.
Perameles obesula.
,, nasuta.
,, fasciata.
Phascogale penicillata.
,, flavipes.
,, murina.
,, macroura.
Dasyurus Geoffroyi.
,, viverrinus.

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EXPLANATION OF THE PLATES.

In most cases the names of the objects figured, are added to the plates, but in some instances they were too numerous; these latter are all that it is necessary here to explain.

Plate 2, Figs. 1 to 6. Parts of the Ornithorhynchus; explained in detail at p. 39.
Figs. 7—9. Parts of the Echidna, explained at p. 49.

Plate 3, Fig. 1. Skull and teeth of the Wombat—see p. 244.
Figs. 2—5. Skull and teeth of *Macropus Thetidis*, and teeth of *Macropus giganteus*[1]—see p. 61.

Plate 8. Skulls of species of *Hypsiprymnus*; the letters are explained at p. 195.

Plate 12. Fore and hind feet of various Marsupial animals: the fore feet are represented in the upper row, and the hind, in the lower. The inner toe of the hind foot is marked * in the figures.

Fig. 1. Fore and hind feet of *Dasyurus viverrinus*.
2. ,, ,, of *Phascogale penicillata*.
3. ,, ,, of *Didelphys cancrivora*.
4. Hind foot of *Phalangista Cookii*.
5. Fore and hind feet of *Hypsiprymnus penicillatus*.
6. ,, ,, of *Perameles obesula*.
7. ,, ,, of *Phascolomys Wombat*.

Plate 19, Fig. 1. Skull of *Phalangista vulpina*, viewed from beneath.
Fig. 1*a*. A molar tooth of the same, magnified.

[1] By mistake "cigantus" on the Plate.

Fig. 2. Skull of *Phalangista Cookii,* viewed from above.

Fig. 3. Skull of *Petaurus taguanoïdes.*

Fig. 4. Skull of *Petaurus pygmæus,* magnified: 4 *a,* side view of the upper and lower teeth much enlarged.

Fig. 5. Skull of *Phalangista Neillii,* magnified: 5 *a,* side view of the teeth of the upper and ower jaws much magnified.

Fig. 6. Upper view of the skull of *Tarsipes rostratus,* magnified: 6 *a,* side view of the same: 6 *b,* side view of the lower jaw.

Plate 20, Fig. 1. Skull of *Perameles lagotis.*

2. Ditto of *Perameles obesula,* a large male: 2 *a,* side view of the teeth of the upper jaw: 2 *b,* side view of the lower jaw, from the skull of a female?

3. Ditto of *Perameles myosuros;* 3 *a,* side view of the teeth of the upper jaw.

4. Ditto of *Chæropus castanotis;* 4 *a,* side view of the same. From a drawing belonging to Prof. Owen.

5. Ditto of *Phascolarctus cinereus,* half the natural size; 5 *a,* side view of the same.

Plate 21. Skulls of the various genera of the family *Dasyuridæ.*

Fig. 1. *Myrmecobius fasciatus;* 1 *a,* side view of the teeth of the upper jaw, magnified; 1 *b,* the lower jaw viewed from the inner side.

Fig. 2. *Dasyurus maculatus,* half the natural size.

Fig. 3. *Thylacinus cynocephalus,* half the natural size.

Fig. 4. *Dasyurus ursinus,* half the natural size.

Fig. 5. *Phascogale penicillata,* and side view of the same.

Plate 22. Fig. 1. Skull of *Didelphys cancrivora.*

Fig. 2. Fore part of the skull of a Dasyurus, to show the differences of form and proportions of the nasal bones in this genus, as compared with those of the *Didelphys,* where they are produced in front, and much expanded behind.

Fig. 3. Skull of *Didelphys elegans;* 3 *a* and 3 *b*, other views of the same; 3 *c*, lower jaw; 3 *d*, the same magnified, and viewed from the inner side.

Fig. 4. Molar tooth of the upper jaw of *Thylacinus cynocephalus;* 4 *a*, a true molar tooth of the lower jaw of the same.

Fig. 5. Molar tooth of a Dasyurus; 5 *a*, ditto of lower jaw.

Fig. 6. ,, of *Perameles myosuros.*

Fig. 7. ,, of *Perameles obesula.*

Fig. 8. ,, of a species of *Hypsiprymnus.*

Fig. 9. ,, of *Phalangista Cookii.*

Fig. 10. ,, of *Phalangista vulpina.*

Fig. 11. ,, of a species of Macropus.

The above figures, from No. 4 to No. 11 inclusive, are more or less magnified representations of the penultimate true molar tooth of the left side of the upper jaw, as found in the principal genera of the Marsupiata.

The four principal cusps, or tubercles, observable on the crown of the more complicated of these teeth, are marked A, B, C, and D; the anterior pair, A and C, are partially joined, so as to form a slightly interrupted transverse ridge in the teeth, fig. 10, and a second similar ridge is formed by the junction of the posterior pair of principal cusps, B and D. The principal cusps are also similarly united in the tooth, fig. 8, but in *Macropus* (fig. 11), they are most perfectly united, and form the high transverse ridges observed in the molar teeth of the species of that genus. In the tooth, fig. 7, all the cusps are most evenly developed, and there are besides these, four smaller cusps, 1, 2, 3, and 4, arranged in a line along the outer side of the tooth, and, if I am not mistaken in my identification of the corresponding parts in these molars, they become very important portions of the tooth in the carnivorous type of dentition, fig. 4; here, it appears as if the cusps 2 and 3 were much developed, and bent inwards so as to be united to the principal cusps, A and B[1]; the cusp, D, is wanting,

[1] It appeared to me, upon first comparing the molar teeth of the Thylacinus with those of the Dasyurus, that the chief difference consisted in the absence of the small cusps, 2 and 3, in the molars of the former animal: but observing

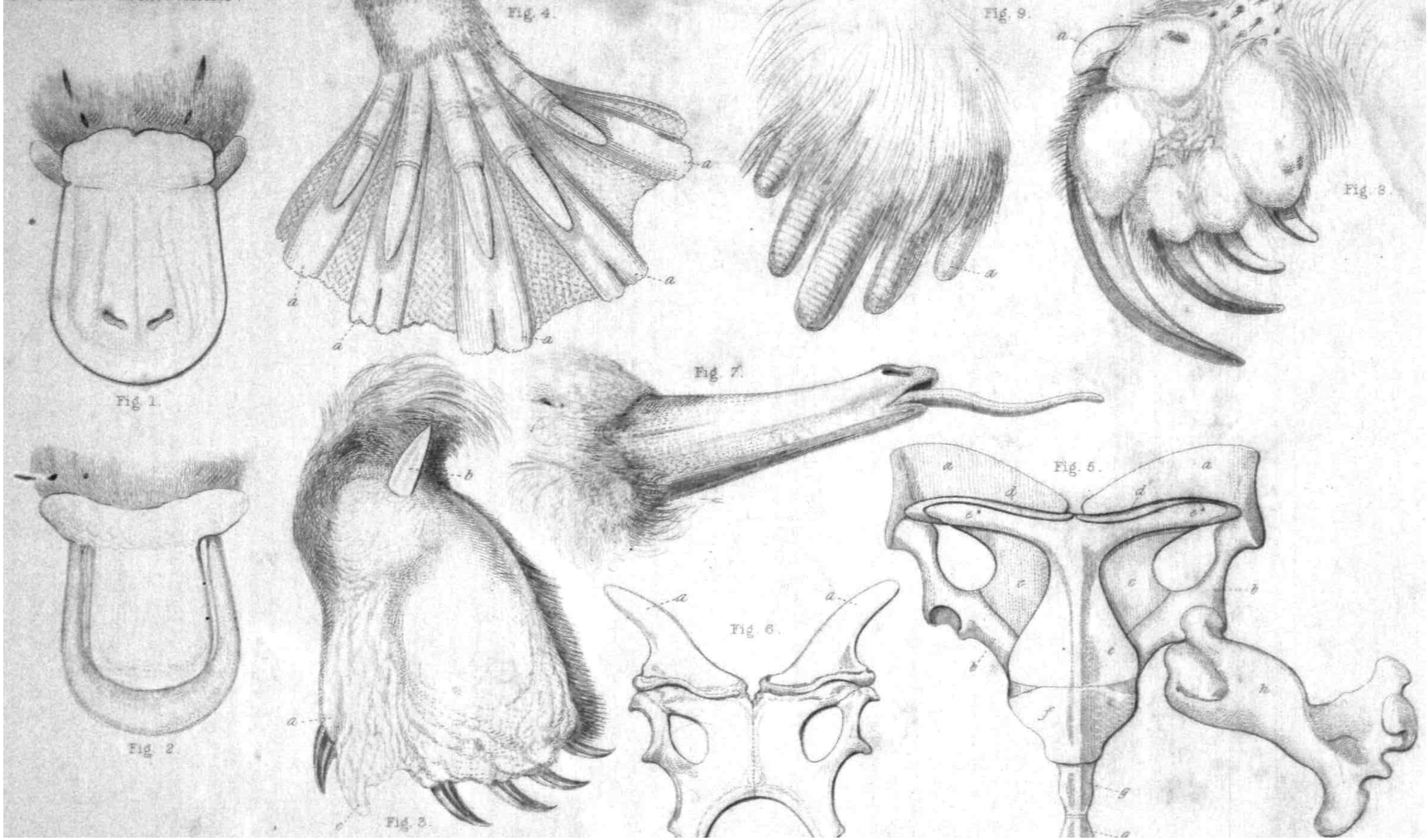
as will be rendered pretty evident upon inspecting the tooth 6, where, owing to the comparatively small development of the cusp D, the crown approaches to the triangular form which is so characteristic of figs. 4 and 5. The part of the tooth which I have *called the band, is most developed in the fore part of the molar,* fig. 11, and is apparent in the teeth figured, where marked *.

that these small cusps are approximated to the principal cusps in the second true molar of Dasyurus (or at least are much less widely separated than in the third molar), and that in the first molar the cusps 3 and B, are still more approximated, and the cusps 2 and A are partially joined, I have since thought it more probable that in *Thylacinus* the small and principal cusps are united.

END OF VOL. I

Wilson and Ogilvy, 57, Skinner Street, Snowhill, London.

...terhouse's Mammalia.



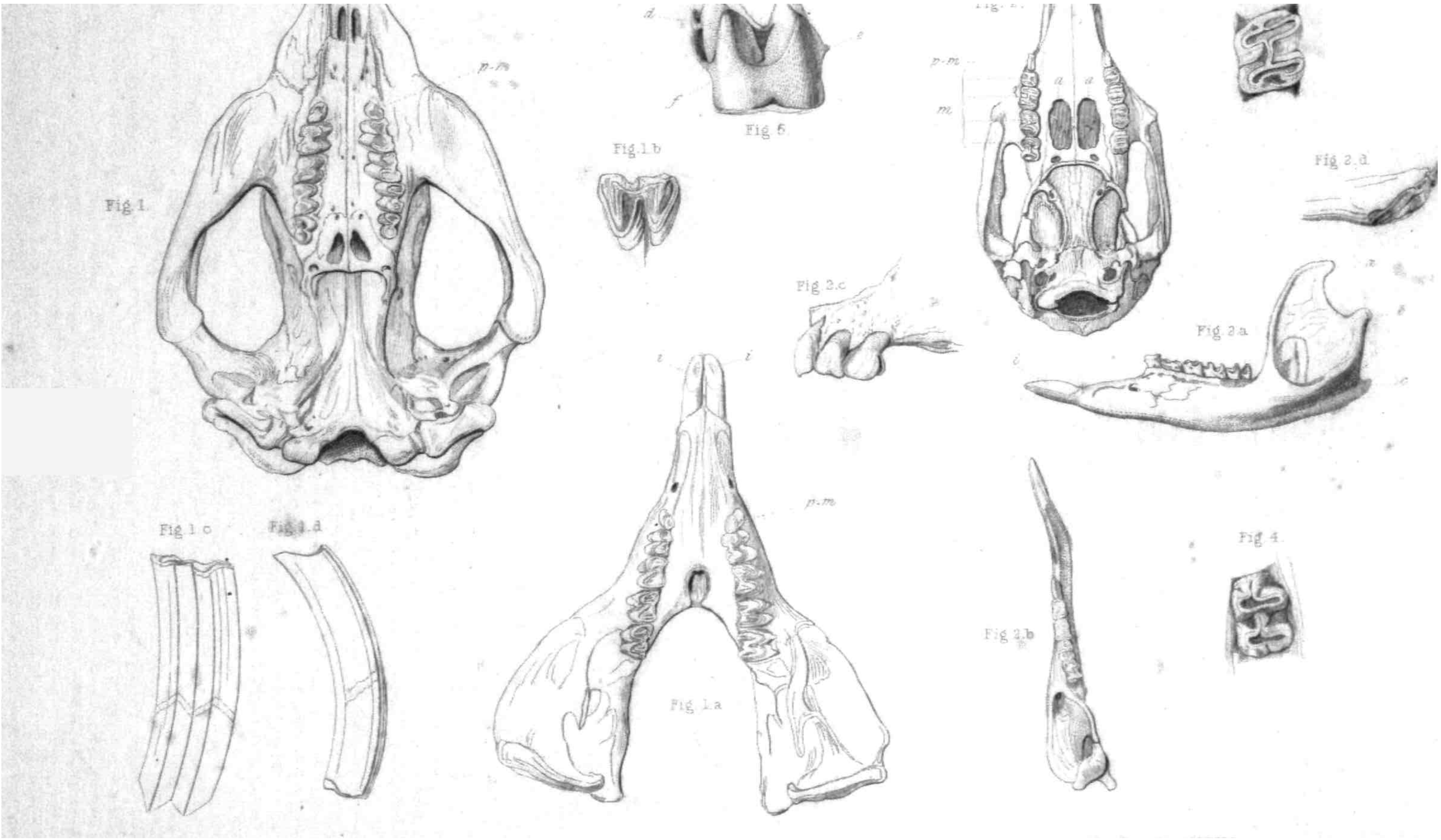
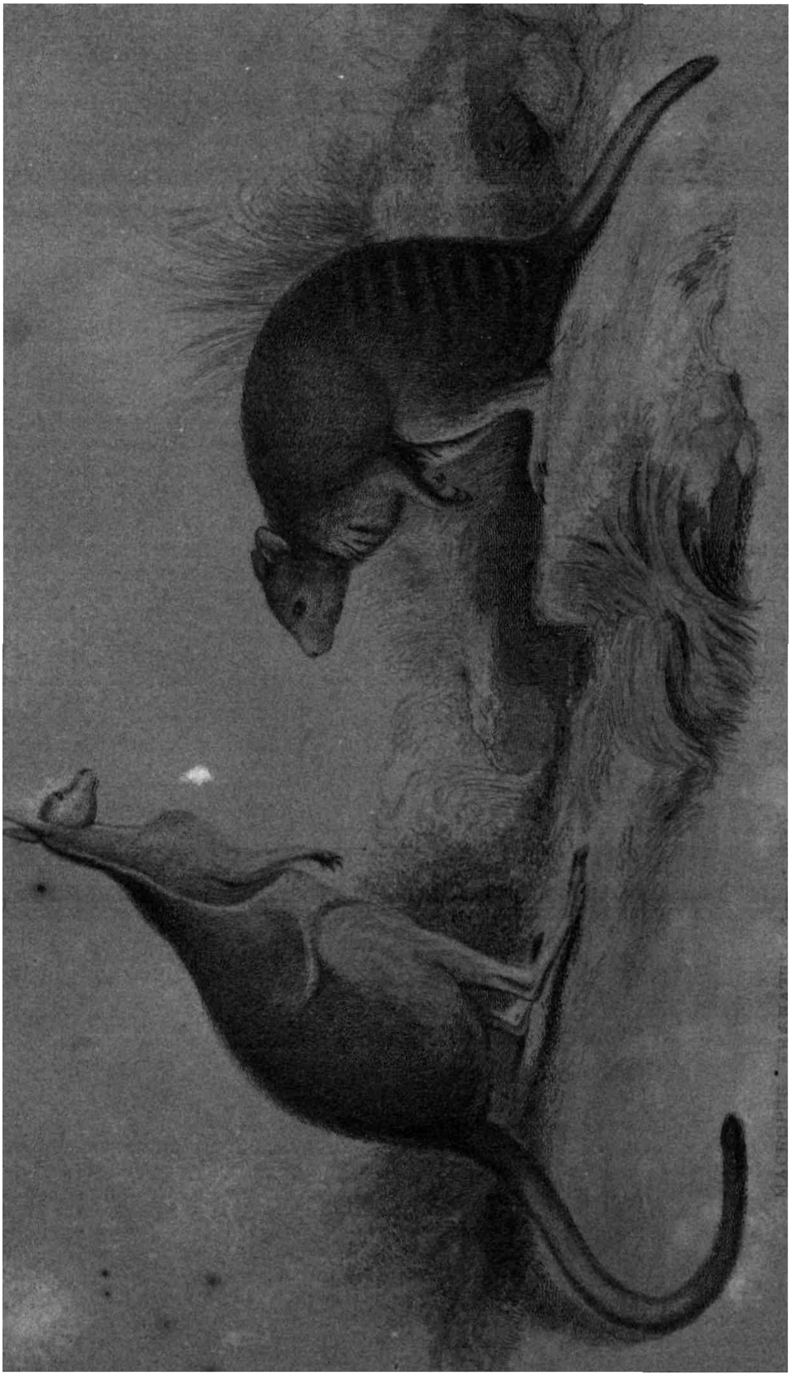


Fig. 1.
p.m
Fig. 1.b
Fig. 5
d
e
f
Fig. 2.c
p.m
m
a
a
Fig. 2.d
Fig. 2.a
i
i
i
c
Fig. 1. c
Fig. 1. a
Fig. 2.b
Fig. 4.



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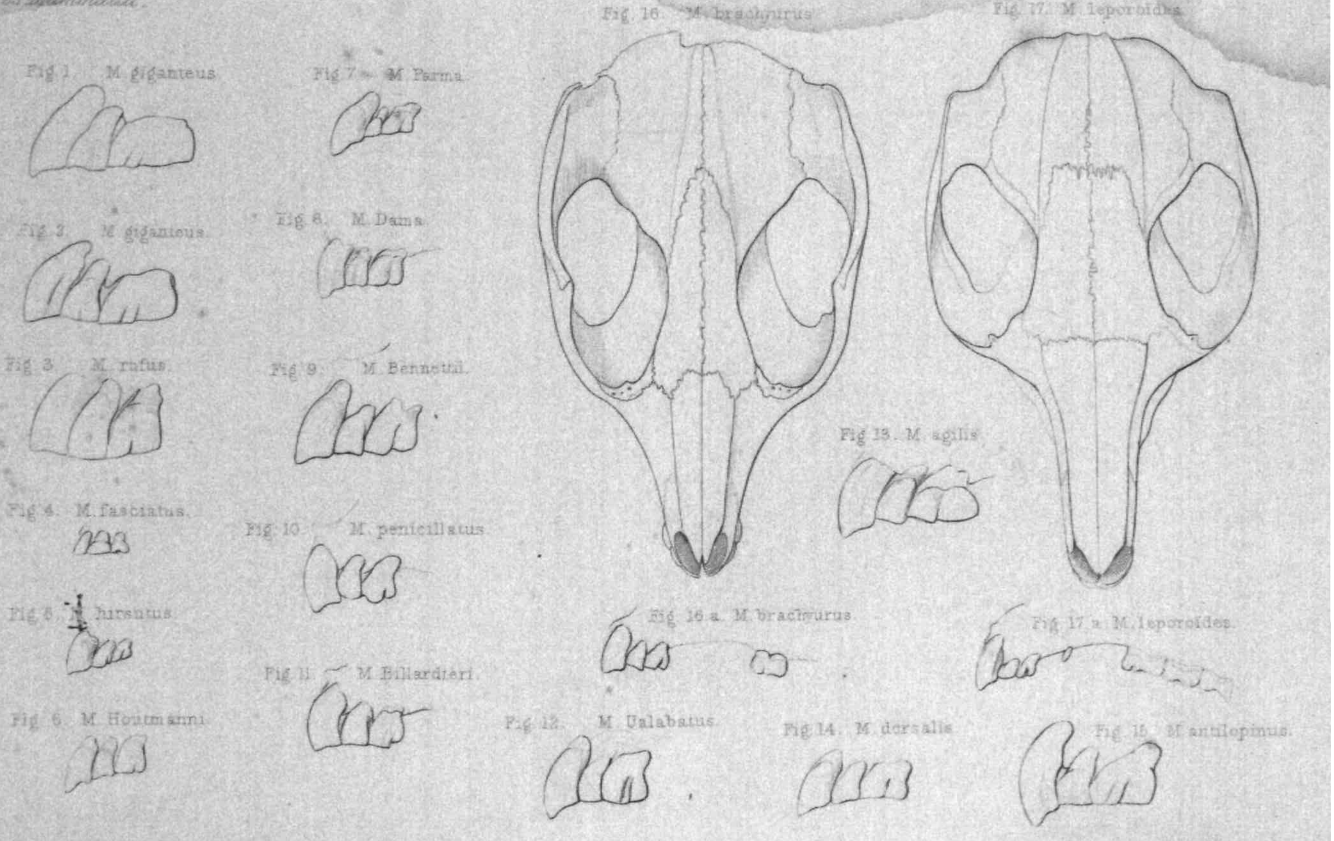
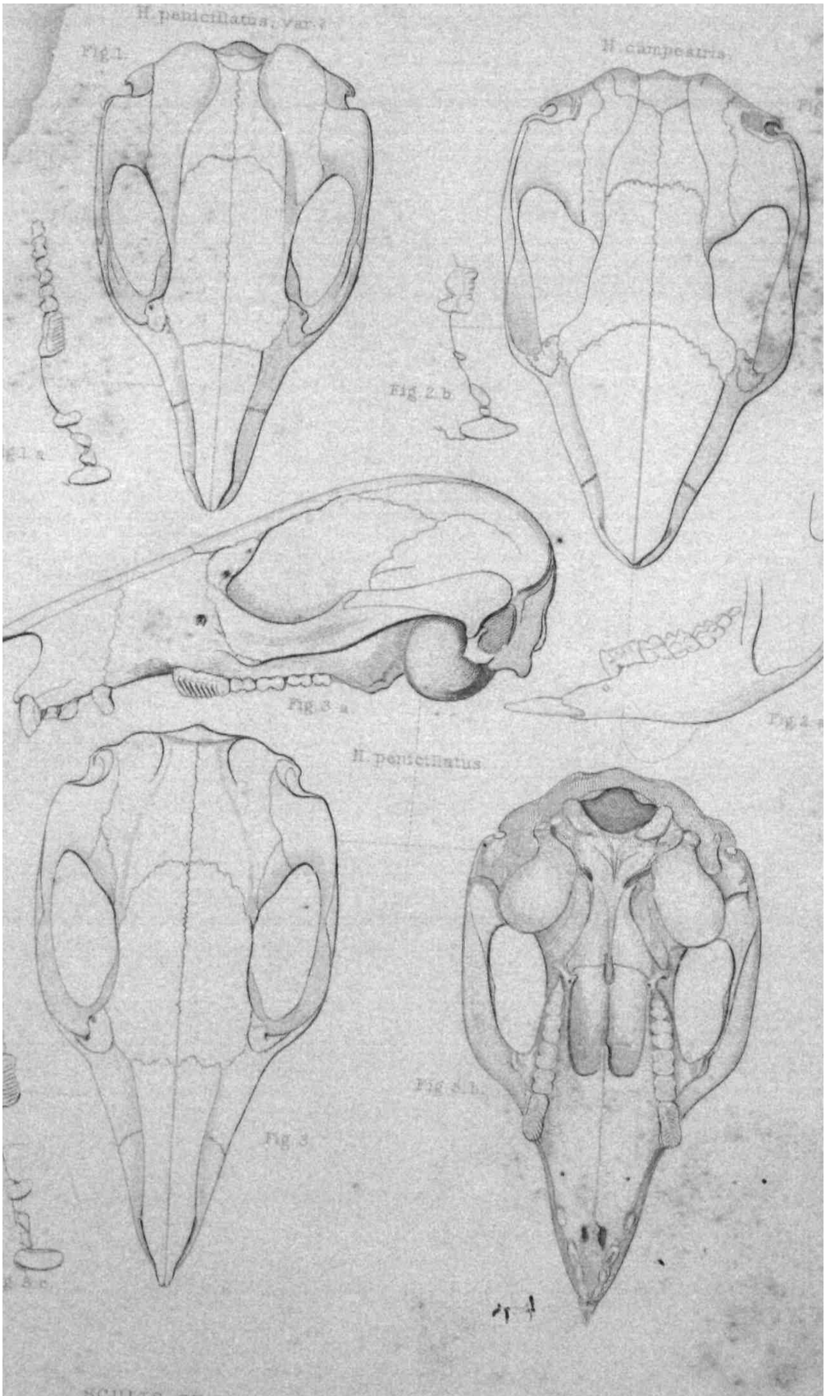
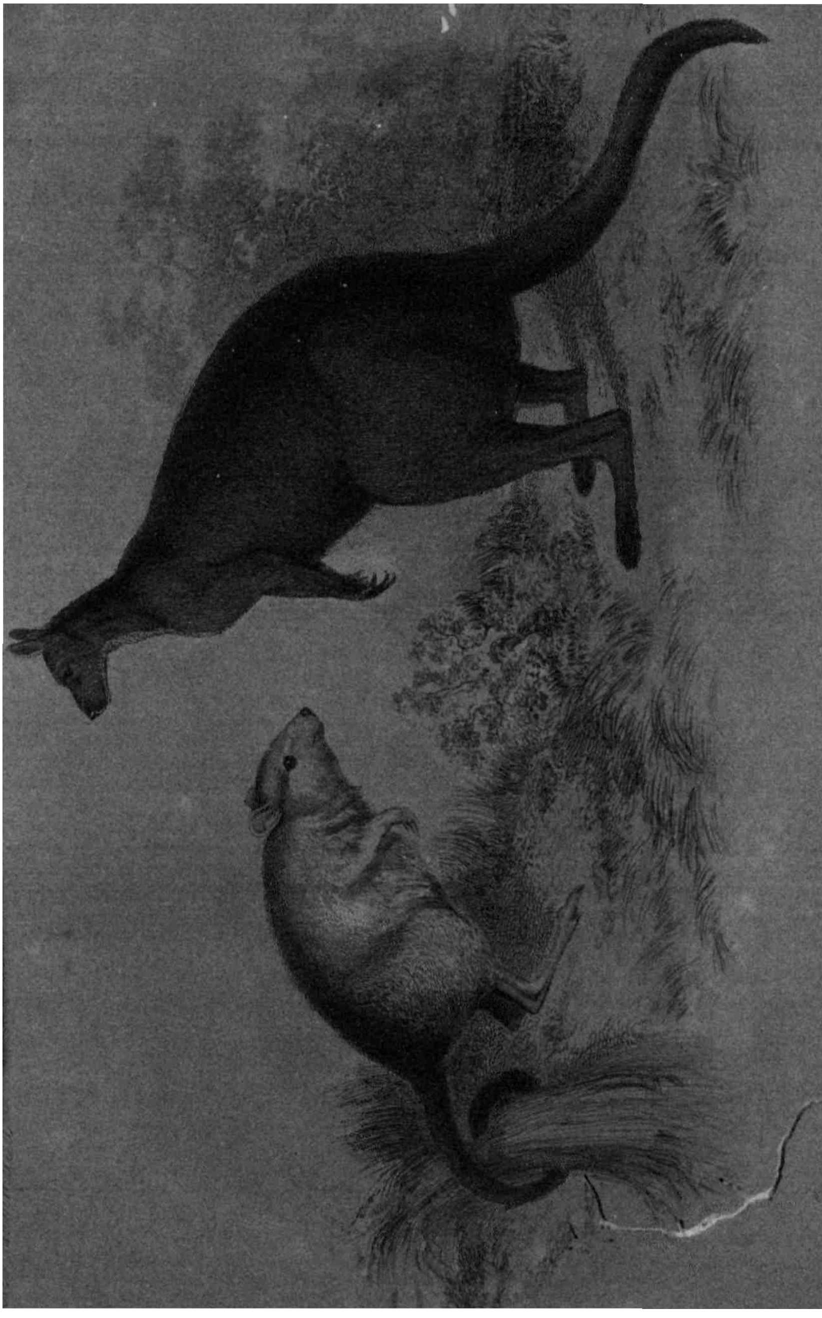


Fig. 1-15. UPPER INCISOR TEETH of VARIOUS SPECIES of MACROPUS. Fig. 16. SKULL of M. BRACHYURUS. Fig. 17. SKULL of M. LEPOROIDES.



SCULLS OF VARIOUS SPECIES OF HYPSIPRYMNUS.



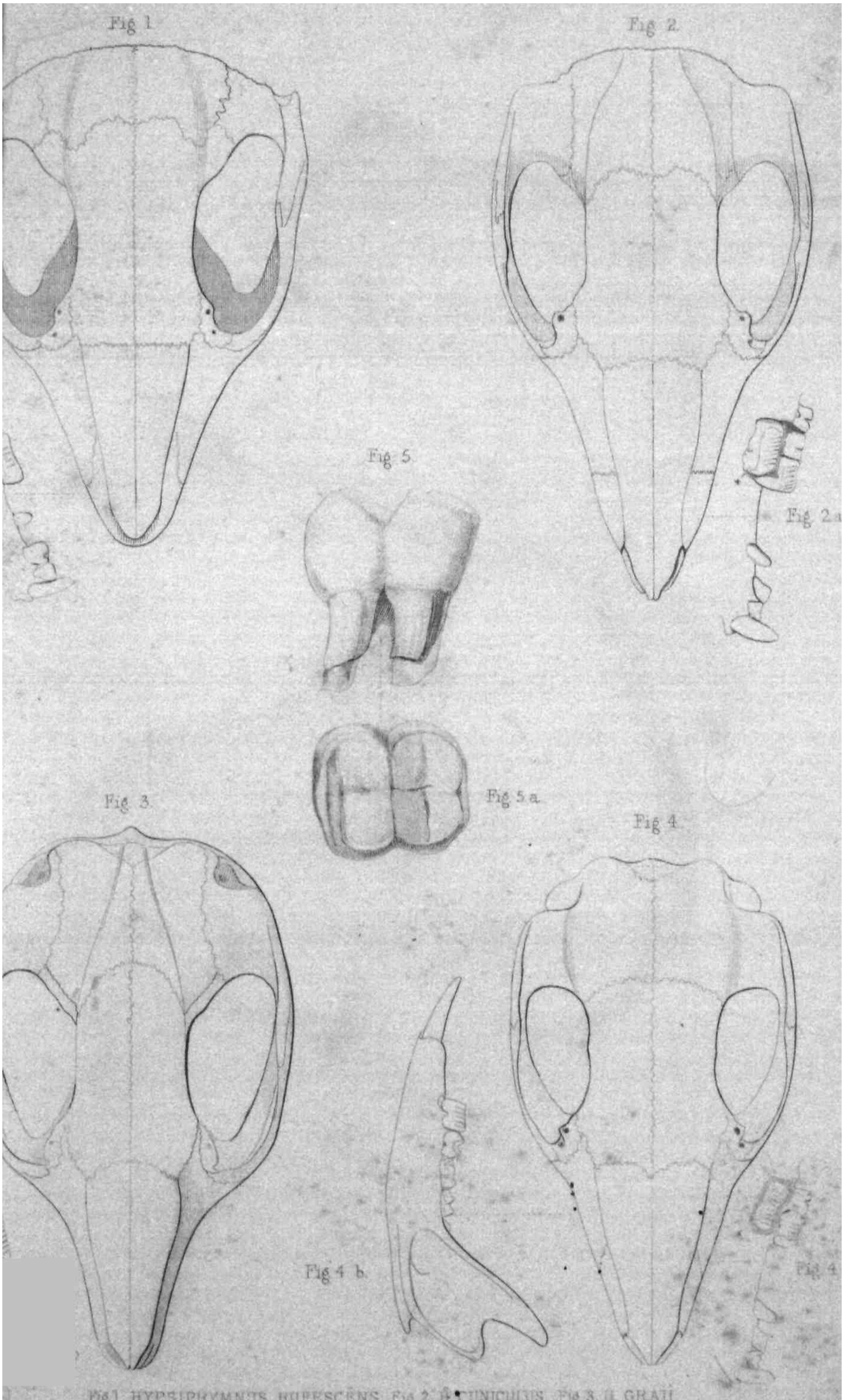


Fig 1. HYPSIPRYMNUS RUFESCENS. Fig 2. H. CUNICULUS. Fig 3. H. GRAII.
Fig 4. H. GAIMARDII. Fig 5. MOLAR TOOTH OF A SPECIES OF HYPSIPRYMNUS MAGNIFIED.

...y H. J. Brebwick. London, Published by H. Baillière 219 Regent St 1845. Printed ...

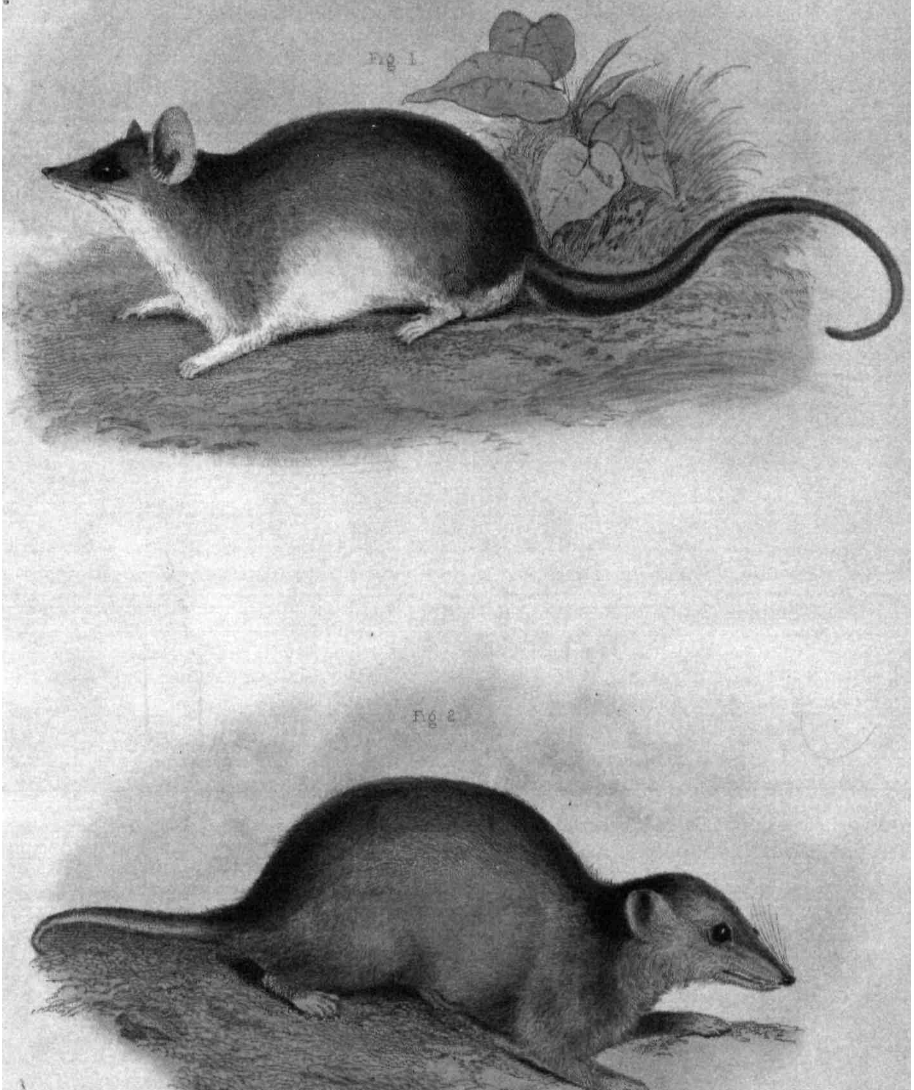


Fig. 1. DIDELPHYS ELEGANS. Fig. 2. DIDELPHYS BRACHYURA.